M Series - M^2 Technology
Retail Scales

M1XX, M2XX, M3XX, M4XX, M6XX

Service Instructions

ENGLISH

DRAFT

76104-186 Issue 0 28.01 2004

©Avery Berkel Limited 2005. All rights reserved.

The information contained herein is the property of Avery Berkel Limited and is supplied without liability for errors or omissions. No part may be reproduced or used except as authorised by contract or other written permission. The copyright and the foregoing restriction on reproduction and use extend to all media in which the information may be embodied.

Trademarks and acknowledgements

Avery, Avery Berkel, Avery Weigh-Tronix are registered trademarks in certain jurisdictions and owned and registered by companies within the Avery Weigh-Tronix Group.

All brands and product names used within this document are trademarks or registered trademarks of their respective holders.

IMPORTANT

When programming or configuring the equipment you must ensure that you comply with all relevant standards and legislation. The example settings given in this book may not be legal for trade with the public.

Contents

page no.

1 Safety 11

Installation and Service 11
1.1 Electrical installation 11
1.2 Risk of electric shock 11
1.3 Additional service precautions 12
1.4 Replacing batteries 12
1.5 Safe handling 12
1.6 ESD handling precautions 12

2 Model range 15

2.1 M100 15
2.2 M200 16
2.3 M202 17
2.4 M300 18
2.5 M400 / M410 / M420 19
2.6 M651 20

3 Installation 23

3.1 Kit list 23
3.2 Installation precautions 24
3.2.1 Installation location 24
3.2.2 Handling precautions 24
3.3 Levelling the scale 25
3.4 Cable management 26
3.5 DCU converter 27
3.6 Self service keyboard installation (M300) 28

4 Displays & Keys 31

4.1 Display 31
4.2 Keys 32

5 Service mode 37

5.1 Service mode overview 37
5.2 Enter / Exit service mode 38
5.2.1 Full service access 38
5.2.2 Restricted service access 39
5.2.3 Exit service mode 39
5.3 Navigating service menus 40
5.4 Diagnostics 41
5.5 Configuration tables 45
5.5 Country configuration 50
5.6 Calibration 54
5.7 Site gravity 55
5.8 Service PIN 56
5.9 Euro setup menu 57
5.9.1 Euro rate and Euro symbol 57
5.9.2 Euro wizard 58
5.10 Clone machine 60
5.11 Data clone 61
5.12 Label editor menu 62
5.13 Label editor menu 63
Note: Restore Format 68
5.14 Service setup 69
5.15 Memory setting guidelines 73
5.15.1 Set Trans Memory 73
• Settings notes 1 - Single servers 74
Note: Settings notes 2 - Dual servers 75
• Consolidation of dual servers 75

6 Service procedures 79

6.1 Power up / Power down 79
6.2 Calibration 80
6.3 Top cover and cross 81
6.4 Left cover 82
6.5 Rear cover (M100) 83
6.6 Customer display chassis 84
6.7 Front cover / vendor displays 85
6.7.1 Front cover (nose cone) 85
6.7.2 Vendor display & keyboard 86
6.8 Column mounting (M200, 300, 400) 88
6.9 Main board 89
6.10 Installing expansion boards 90
6.10.1 Installing a RAM expansion PCB 90
6.10.2 WLAN (RF) PCB 91
6.11 Loadcell 92
6.12 Power supply 93
6.13 I/O board and chassis 94
6.14 Printer servicing 95
6.14.1 Printer chassis and cassette 95
6.14.2 Print head replacement 96
6.14.3 Cleaning the print head 97
6.14.4 Paper routes 99

7 Exploded views 103

7.1 M100 Scale body 103
7.2 M100 Vendor display assembly 106
7.3 M100 Customer display assembly 108
7.4 Cassette printer assembly 110

8 Schematic / Wiring diagrams 115

8.1 External connections 115
8.1.1 Overview 115
8.1.2 Scanner connection 116
8.2 Internal connections 117
8.2.1 Power and printer 117
8.2.2 M100 loadcell, displays and keyboard 118

9 Module information 123

9.1 Main board 123
9.1.1 Module layout 123
9.1.2 Pinouts 125
9.1.3 Dip switch (8) 125
9.1.4 Links 125
9.1.5 Hardware compatibility 127
9.1.6 Special precautions 127
9.2 Display PCB 128
9.3 Power supply 130
9.4 I/O board 132
9.4.1 Module layout 132
9.4.2 Pinouts 133
9.5 T103 Loadcell 134

10 Networks 137

10.1 Introduction 137
10.2 Typical network 138
10.2.1 2 scale network 138
10.2.2 Multi-scale network 138
10.2.3 Groups of scales (network ID) 138
10.3 Network protocol 140
10.4 Wiring / terminations 140

Note: Cable lengths 140
10.5 Network setup 141
10.5.1 Auto configure 141
10.5.2 Manual network configuration 142
10.5.3 Removing a scale 145
10.6 Using the network map 146
10.7 Backup server operation 147
10.8 Local mode 149
10.9 Adding a machine to a CX/Advantage network 150

11 Modem operation 153

11.1 Modem setup 153
11.2 Setting up a dial up account on the PC 156
• Manual setup 157
11.3 Modem connection 158
11.3 Modem adaptor cable 158
• Standard modem loom 158

Index 159

1 Safety

Installation and Service

1.1 Electrical installation

1.2 Risk of electric shock

1.3 Additional service precautions

1.4 Replacing batteries

1.5 Safe handling

1.6 ESD handling precautions

1 Safety

Installation and Service

THE EQUIPMENT CONTAINS NO USER SERVICABLE COMPONENTS.

Installation and maintenance of the equipment must only be carried out by trained and authorised personnel.

1.1 Electrical installation

The mains lead must be connected to a supply outlet with a protective earth contact. The electrical supply at the socket outlet must provide over current protection of an appropriate rating.

Pluggable equipment must be installed near an easily accessible socket outlet. Permanently connected equipment must have a readily accessible disconnect device incorporated in the fixed wiring.

For your protection all mains (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused source and protected by an approved ground fault protection device (RCD, GFCI etc.)
IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

1.2 Risk of electric shock

This equipment is powered by a mains voltage which presents an electric shock hazard.

Always completely disconnect the power supply:

- Before removing the machine cover(s).
- Before performing any routine maintenance.
- Before cleaning the machine.

1.3 Additional service precautions

- When the covers are removed, do not apply power to the unit unless specifically instructed to do in this handbook.
- When working on live equipment, exercise great care, use insulated tools and test equipment, and do not work alone.
- When testing or fault finding, exercise extreme care. Ensure that any test equipment used is in good condition and capable of withstanding the existing voltages.
- All tools used must have insulated handgrips. Test probes and jumper leads must be in good condition with adequate insulation. Test probes with claw ends and jumper leads must not have insecure parts that may fail during use.

1.4 Replacing batteries

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

1.5 Safe handling

When lifting, moving or supporting the machine, take its weight into consideration.

1.6 ESD handling precautions

When handling printed circuit boards and electronic components, observe the following ESD handling precautions:

- Wear an earthed antistatic wrist strap.
- Ensure that all electronic components/boards are stowed appropriately, by use of conductive/antistatic work surfaces and packaging.

2 Model range

2.1 M100

2.2 M200

2.3 M202

2.4 M300

2.5 M400 / M410 / M420

2.6 M651

2 Model range

2.1 M100

1. Weigh pan
2. Vendor display
3. Keyboard
4. Printer door
5. Printer ticket mouth

Customer display on rear of machine (not shown)

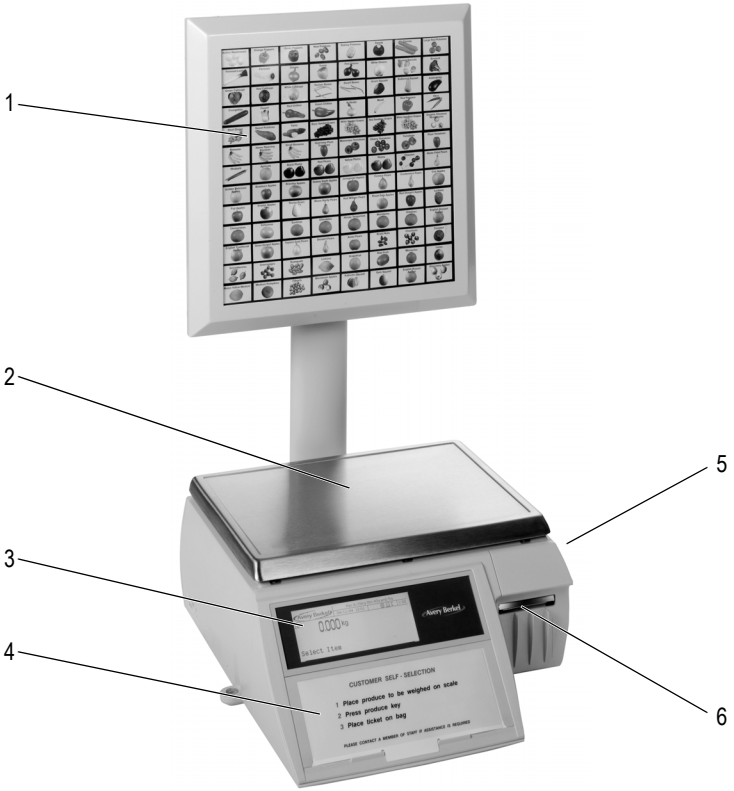
2.2 M200

1. Weigh pan
2. Vendor display
3. Keyboard
4. Column mounted customer display (on rear)
5. Printer door
6. Printer ticket mouth

2.3 M202

1. Vendor display
2. Weigh pan
3. Keyboard
4. Column mounted customer display (on rear)
5. Printer door
6. Printer ticket mouth

2.4 M300



1. Self service keyboard
2. Weigh pan
3. User display
4. User instruction panel / programming overlay
5. Printer door
6. Printer ticket mouth

2.5 M400 / M410 / M420

1. Vendor displays
2. Keyboard
3. Weigh pan
4. Clam shell printer (M410 / M420 only)
5. Printer door (M400 / M420 only)
6. Printer ticket mouth (M400 / M420 only)

Customer display on rear of machine (not shown)

2.6 M651

1. Vendor displays
2. Keyboard
3. Remote platform
4. Printer ticket mouth

Customer display on rear of machine (not shown)

3 Installation

3.1 Kit list

3.2 Installation precautions

3.3 Levelling the scale

3.4 Cable management

3.5 DCU converter

3.6 Self service keyboard installation (M300)

3.7 Hanging scale installation (M500)

3 Installation

3.1 Kit list

Before assembling / installing the scale, ensure that the following items were included in the pack. Report any missing items to the support department.

Kit list
Scale
Quick user guide
Menu flowcharts
Documentation CD
Self service keyboard (M300 only)

3.2 Installation precautions

3.2.1 Installation location

Make sure that the work surface is firm, steady and free from vibration and draughts.

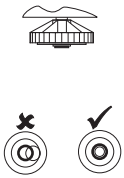
CAUTION: To avoid the risk of RSI (Repetitive Strain Injury) it is important to ensure that machine is placed on a surface, which is ergonomically satisfactory to the user. In cases where usage is prolonged we recommend frequent breaks for the user.

3.2.2 Handling precautions

Mis-handling of the scale can affect the scale's ability to weigh accurately.

3.3 Levelling the scale

Adjust the scale's feet until the spirit level indicates that it is level.



3.4 Cable management

In order to protect cables from being accidentally pulled out and damaged, all cables from the machine should be held in place using the cable clamp(s) shown below.

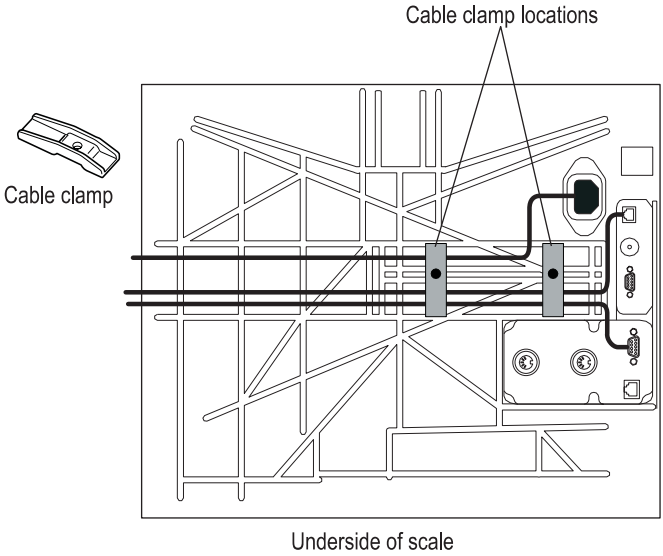


Figure 3.1 Cable clamps

3.5 DCU converter

CAUTION: NOT RECOMMENDED - THE DCU CONVERTER IS NOT FULLY COMPATIBLE WITH M2 SCALES

To use the C400 DCU, you must have an adaptor cable (part number 70734-970).

All data will be stored as per application software v3.5.

Data using features from later sw versions will be lost.

3.6 Self service keyboard installation (M300)

The self service keyboard is supplied as a separate item. It must be connected before the scale will operate

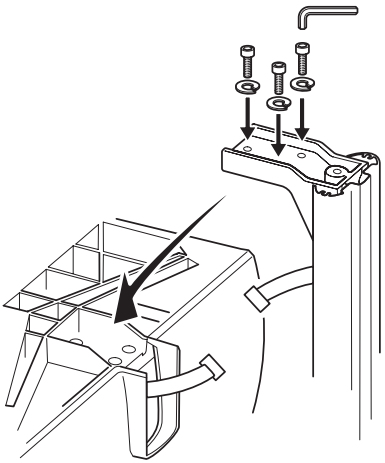


Figure 3.2 Column mounted display fixing arrangement

1. Align the column base near to its proper location.
2. Make the connection between the cables.
3. Secure the column to the scale base using the 3 x socket screws and spring washers provided.

Note: *After installation you may need to configure the keyboard from within the manager mode.*
Refer to the operating instructions, and separate menu sheets for more details

4 Displays & Keys

4.1 Display

4.2 Keys

4 Displays & Keys

4.1 Display

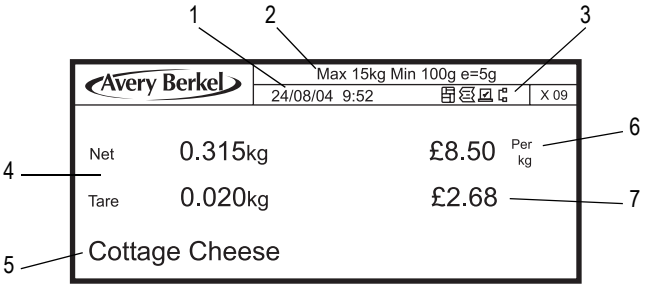


Figure 4.1 Typical weighing display

1. Date & time
2. Metrologic information
3. Status icons
4. Weight information (Net / tare weight)
5. Product description (PLU text)
6. Price per unit
7. Price of goods

4.2 Keys

Test key.
Display test.

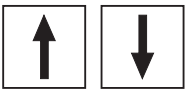
Hand price key
Override programmed price of a PLU.

Fix key
Retain a PLU / Tare for multiple transactions.

Tare key
Subtract the weight of the container when weighing goods.

Add key
Print totals.

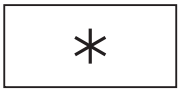
Void key
Cancel an unwanted transaction from a subtotal.



Up / Down keys
Move up / down displayed items on screen.

Price base key
Select price base.

Accept key
Accept entry when prompted ‘Are you sure?’.

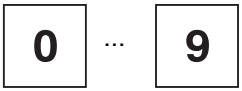


Total key
Totalise transaction and print a label / receipt.

Clear / Cancel key
Clear a PLU or hand entered price.

Zero key
Reset the weight display to zero.

Enter key
Confirm data entry, or, enter a multiple number of items when serving.



Numerical keys
Enter numerical values.

Alpha keys
Upper legend denotes letters that may be used when entering data.

5 Service mode

5.1 Service mode overview

5.2 Enter / Exit service mode

5.3 Navigating service menus

5.4 Diagnostics

5.5 Configuration tables

5.6 Calibration

5.7 Site gravity

5.8 Service PIN

5.9 Euro setup menu

5.10 Clone machine

5.11 Data clone

5.12 Label editor menu

5.13 Label editor menu

5.14 Service setup

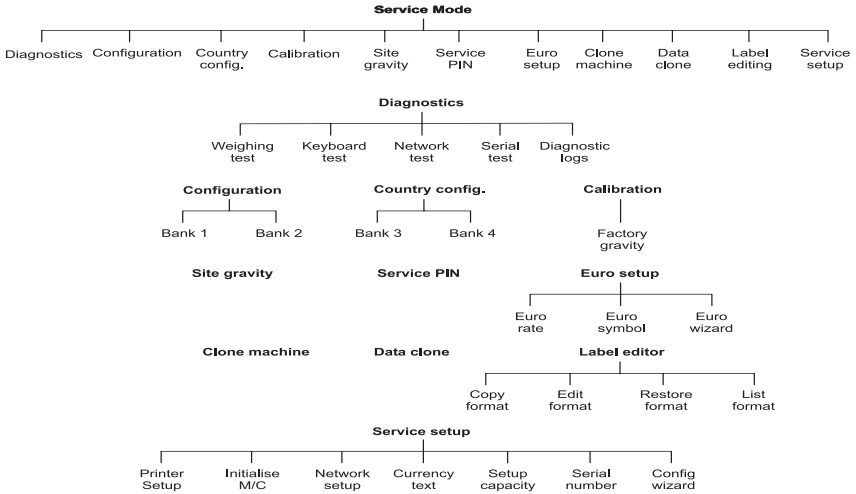
5.15 Memory setting guidelines

5 Service mode

CAUTION: When programming the scale you must ensure that you comply with all relevant standards. The example settings given in this book may not be legal for trade.

5.1 Service mode overview

By setting the scale into service mode, many aspects of the scale may be configured.



5.2 Enter / Exit service mode

There are two service mode levels available

- **Full service access.**
  Full access to all service options, including calibration.
- **Restricted service access.**
  Limited access to certain service options, excluding calibration.

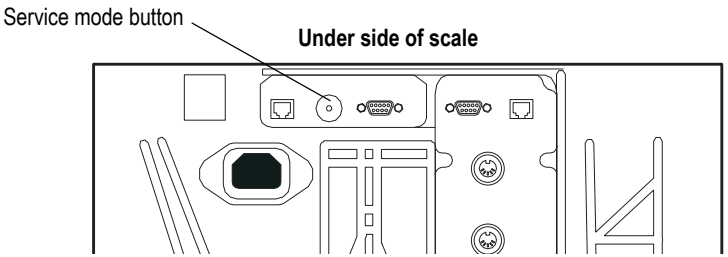
Note: *For all service options, you will need the programming overlay on the keyboard*

5.2.1 Full service access

Full service mode allows unrestricted access to the service configuration menus.

To enter full service access:

1. Switch on the machine.
2. Carefully tilt the machine onto its right-hand side.
3. Break the tamper seal, remove the plastic cover and press the service mode button (shown below).



4. When you have finished making changes, replace the cover and the tamper seal.

5.2.2 Restricted service access

Restricted access limits the changes that can be made to the scale.

Restricted access **excludes** the following:

- Change the capacity.
- Change the gravity zone compensation.
- Calibrate the machine.

To enter restricted service access:

1. Switch the machine off, and then switch on again.
2. Once the machine starts its countdown, enter the service PIN.
   (Default PIN is 9467).

Note: *To change the service PIN see* *Service PIN on page 56.*

5.2.3 Exit service mode

To exit service access:

- Press the 'Home' key to enter manager mode and again to enter operator mode.

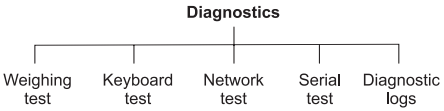
x2

5.3 Navigating service menus

To navigate the menus use the following keys:

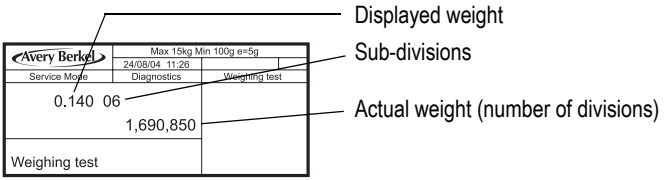
ENTER	**Enter** Select item Enter value
	Back Move up one menu level
	Previous Select previous item
	Next Select next item
	Quick save Save data entered up to this point.
	Home / Exit Enter manager mode Exit service mode
	Numeric keypad Select numbered menu item.

5.4 Diagnostics

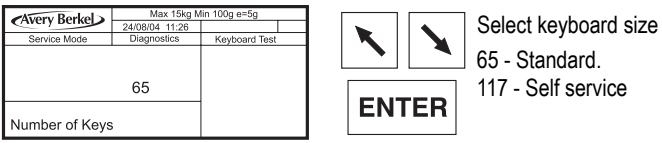


The diagnostics menu allows you to perform a number of tests:

Weighing test



Keyboard test



- Press each key on the keyboard in turn starting from the bottom right and working towards the left for each row of keys.
- Press the same key three times to exit test.

Note: *The 'Enter' key is made up of two keys.*

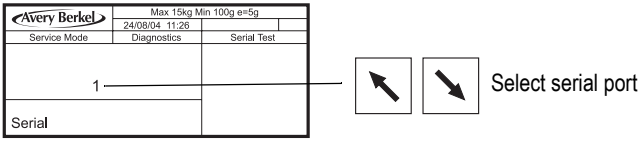
Network test

This tests the scales network connection is working properly.

The scale will talk to another device on the network over a number of cycles. A successful test indicates that the network card and configuration are working correctly.

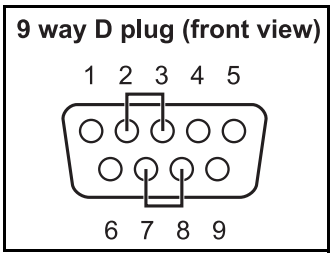
Serial test

This hardware test checks that the serial port is working properly.



The machine will display the baud rate and whether the serial port has passed or failed the test.

Note: *You will need to short out Pins 2-3 and 7-8 at the serial port for the test to work. A plug to perform the network test can be made as shown:*



Diagnostic logs

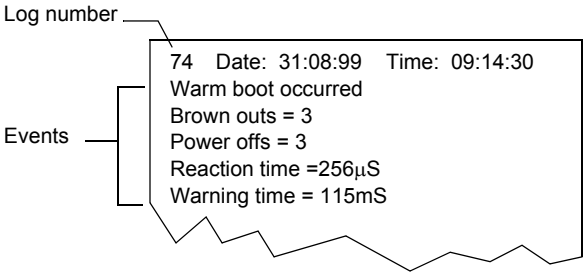
The scale stores a number of logs to record various events. This option is used to print and configure the logs.

Print Logs

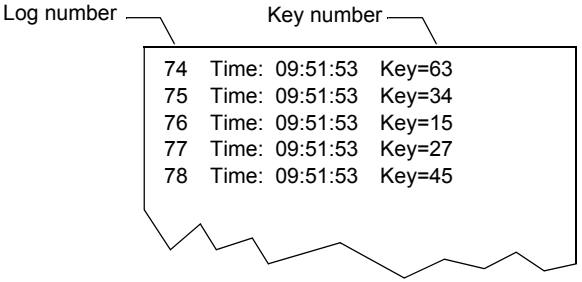
Select from the following

- Print system log
- Print key log
- Print comms. log
- Print all logs

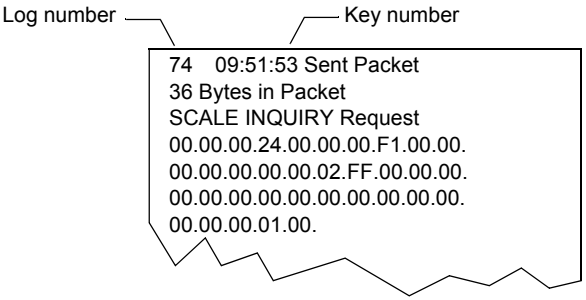
System log: This prints a report showing all the events that have occurred with the machine, including the number of times that the machine has been switched on and off.



Key log: This prints a report showing which keys have been pressed.



Comms log: This prints a report showing the history of the scale network traffic.



Set log size

This option sets the size of the log. If you select a different log size, then you must cold start the machine. Log size options are:

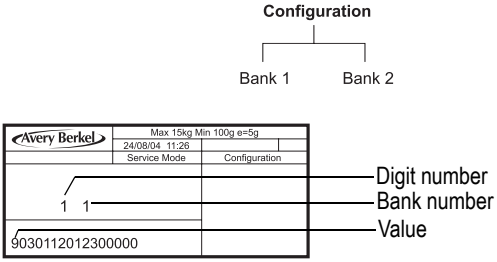
- None - No logs will be stored
- Small - 100 events. (Uses 30K of the available memory)
- Medium* - 500 events. (Uses 160K of the available memory)
- Large* - 1000 events. (Uses 650K of the available memory)
- Huge* - 1000 events. (Uses 650K of the available memory)

Note: *A larger log size will reduce the amount of memory that can be used for PLUs.*

* These require a RAM expansion board to be fitted.

5.5 Configuration tables

The configuration tables determine many of the scale's operating parameters.



Software version 5.0

Bank 1		
Digit		
1	**Capacity (Not available in restricted access mode)**	
	0. Not Used 1. 25lb x 1/8oz (std) 2. 30lb x 0.01 (std) 3. 50lb x 0.01 (std) 4. 6kg x 1g (std) 5. 6kg x 2g (std) 6. 6kg AVR (std) 7. 12kg x 2g (std) 8. 15kg x 5g (std) 9. 15kg AVR (std) A. 25kg x 5g (std) B. 30kg x5g (std) C. 30kg AVR (std) D. 30lb/15kg (std) E. 60kg x 20g (std)	F. 150kg x 50g (std) G. 300kg x 100g (std) H. 6kg x 1g (low) I. 6kg x 2g (low) J. 6kg AVR (low) K. 12kg x 2g (low) L. 15kg x 5g (low) M. 15kg AVR (low) N. 25kg x 5g (low) O. 30kg x5g (low) P. 30kg AVR (low) Q. 60kg x 20g (low) R. 150kg x 50g (low) S. 300kg x 100g (low) T. 60kg x 10g (low)
2	**Tare system**	
	0. Free 1. Free, Graduated 2. Free, Cumulative, Graduated 3. Free, Cum., Grad, Proportional	4. Free, Stored 5. Free, Graduated, Stored 6. Free, Cumulative, Graduated, Stored 7. Free, Cum, Grad, Prop, Stored

3	**Tare display**	
	0. No tare display 1. Negative weight display	2. Separate tare display only 3. Separate tare and negative weight
4	**Minimum weight disturbance**	
	0. 1 division 1. 4 divisions	2. 10 divisions 3. 20 divisions
5	**Bleep behind zero, over balance lost**	
	0. Disabled	1. Enabled
6	**Numeric entry timeout**	
	0. Disabled	1. Enabled
7	**PLU auto recall timeout**	
	0. None 1. 0.6 Seconds 2. 1.0 Seconds	3. 0.3 Seconds 4. 0.4 Seconds 5. 0.5 Seconds
8	**Receipt tax printing**	
	0. None 1. Totals Tax	2. Itemised Tax
9	**Weight filter type**	
	0. Settling time 0.2s, (71.2Hz) 1. Settling time 0.5s, (71.2Hz) 2. Settling time 1.0s, (71.2Hz) 3. Settling time 1.9s, (71.2Hz)	4. Settling time 0.2s, (81.2Hz) 5. Settling time 0.5s, (81.2Hz) 6. Settling time 1.0s, (81.2Hz) 7. Settling time 1.9s, (81.2Hz)
10	**Price base**	
	0. Single Price Base (lb/kg) 1. Single Price Base (1/4lb/100g)	2. Dual Price Base (lb/kg) 3. Dual Price Base (1/4lb/100g)
11	**Printer type**	
	0. None 1. Receipt only	2. Label only 3. Label & Receipt
12	**Default sales mode and machine type**	
	0. Hand Price Mode, Weighing 1. PLU Mode, Weighing	2. Hand Price Mode, Non-Weighing 3. PLU Mode, Non-Weighing
13	**Add function**	
	0. None 1. Transaction + Total 2. Total only	3. Receipt only 4. Transaction and receipt
14	**Date type**	
	0. Numeric	1. Alpha
15	**Date format**	

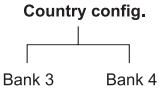
	0. DD MM YY 1. MM DD YY 2. YY MM DD	3. DD MM YYYY 4. MM DD YYYY 5. YYYY MM DD
16	**Maximum transaction sequence number**	
	0. 999999 1. 99999 2. 9999	3. 999 4. 99 5. 9

Bank 2		
Digit		
1	**Dummy zero in Unit price**	
	0. 6 digit UP, 6 digit TP, no dummy zero 1. 6 digit UP, 6 digit TP, dummy zero	2. 5 digit UP, 6 digit TP, no dummy zero 3. 8 digit UP, 8 digit TP, no dummy zero
2	**Transaction rounding**	
	0. Round to nearest 1 1. Round to nearest 5	2. Round to nearest 10 3. Round to nearest 25 4. Round to nearest 50
3	**Number of decimal places**	
	0. No decimal places 1. 1 decimal place 2. 2 decimal places	3. 3 decimal places 4. 0 on unit price, 1 on total price 5. Thousands separators
4	**Punctuation**	
	0. Decimal point	1. Comma 2. Inverted comma
5 &6	**Currency symbol**	

Bank 2				
Digit				
	00. User defined (see page 72) 01. £ 02. $ 03. R 04. F (French) 05. Kr 06. DM 07. S 08. Fr 09. f 10. Lit 11. P 12. E 13. K 14. M	15. D 16. RM 17. L 18. N$ 19. Esc 20. Pta 21. Rp 22. mk 23. PX 24. SR 25. zt 26. Kc 27. SK 28. kr 29. DHS 30. Won	31. bt 32. Pts 33. EEK 34. Lt 35. € 36. Eur 37. R$ 38. B 39. C 40. Q 41. TL 42. F (Belgian) 43. BD 44. LE 45. JD 46. KD	47. LL 48. RO 49. QR 50. SR 51. YR 52. Ft 53. kn 54. Lm 55. Ksh
7	**Receipt rounding**			
	0. Round to nearest 1 1. Round to nearest 5		2. Round to nearest 10 3. Round to nearest 25 4. Round to nearest 50	
8	**Auto subtotal display**			
	0. Disabled		1. Enabled	
9	**Subtotal timeout**			
	0. 1 Second 1. 2 Seconds 2. 3 Seconds		3. 4 Seconds 4. 5 Seconds	
10	**Not used**			
	0. Dot Monitor Off, Dot Save Off (Default) 1. Dot Monitor On, Dot Save Off, 30 minute nag message 2. Dot Monitor On, Dot Save Off, 4 hour nag message 3. Dot Monitor On, Dot Save On, 30 minute nag message 4. Dot Monitor On, Dot Save On, 4 hour nag message			
11	**Date 1 field on hand price labels**			
	0. Date		1. Time	
12	**Leading zero suppression**			
	0. Disabled		1. Enabled	
13	**Printed boxes (if defined)**			
	0. Disabled		1. Enabled	

Bank 2		
Digit		
14	**One shot function mode**	
	0. Disabled	1. Enabled
15	**Not used**	
16	**Not used**	

Country configuration



Bank 3		
Digit		
1	**Balance range**	
	0. ±2%	1. ±5%
2	**Balance at power up**	
	0. Disabled	1. Enabled
3	**Large step behind zero**	
	0. Disabled	1. Enabled
4	**Reduced zero tracking**	
	0. Disabled	1. Enabled
5	**Retained tare mode**	
	0. Disabled	1. Enabled
6	**Manual Tare Cancellation**	
	0. None 1. Tare key	2. Zero key 3. Tare & Zero key1. Tare key
7	**Price/tare interlock**	
	0. Disabled	1. Enabled
8	**Fix tare options**	
	0. Fix tare and unit price	1. Fix tare only
9	**Open cash drawer with zero total**	
	0. Disabled	1. Enabled
10	**Swap price1 / price 2 positions on label**	
	0. Disabled	1. Enabled
11	**Receipt total currency symbols**	
	0. Disabled	1. Enabled
12	**Minimum prepack weight**	
	0. 1 division	1. 20 divisions
13	**Prepack allows stored/grad tares**	
	0. Disabled	1. Enabled
14	**Triple zero key**	
	0. Disabled	1. Enabled

Bank 3		
Digit		
15	**Tax system**	
	0. Inclusive 1. Exclusive	2. Inclusive, PoS only 3. Exclusive, PoS only
16	**Tax reference in description**	
	0. Disabled	1. Enabled

Bank 4		
Digit		
1 & 2	**Language**	
	00. English 01. Spanish 02. RSA 03. French 04. German 05. Italian 06. Dutch 07. Danish 08. Polish	09. Czech Rep 10. Portuguese 11. Finnish 12. Norwegian 13. Turkish 14. Greek 15. Croatia 16. Hungary 17. Sweden 18. Arabic
3	**Sales key layout**	
	0. Euro/Arabic price base key 1. Euro/Arabic double zero key 2. USA ½ and ¼ keys 3. M2 European & Price base 4. M2 Euro/Arabic double zero key	5. M2 USA ½ and ¼ keys 6. M700 Euro/Arabic price base key 7. M700 Euro/Arabic double zero key 8. M700 USA ½ and ¼ keys
4	**Manager key layout**	
	0. European Qwerty 1. European Abcdef 2. Greek 3. Turkish 4. Arabic 5. M2 European QWERTY 6. M2 European ABCDEF 7. M2 Greek 8. M2 Turkish	9. M2 Arabic A. M700 European QWERTY B. M700 European ABCDEF C. M700 Greek D. M700 Turkish E. M700 Arabic
5	**Receipt algorithms**	

Bank 4				
Digit				
		Algorithm	Weighed	n x (+ve non-weighed)	n x (-ve non-weighed)
	0.	A	1/1	1/1	0/1
	1.	B	1/1	1/1	1/1
	2.	C	1/1	n/1	0/1
	3.	D	1/1	n/1	n/1
	4.	E	1/1	n/1	0/0
6	**Receipt formats**			
	0. Receipt format 0 - Italian format which includes tare weight 1. Receipt format 1 - No symbols line, symbols printed with transaction data. First line contains text and total price. Second line contains weight/multiplier and unit price/item. 2. Receipt format 2 - As receipt format 2 except total price printed on third line for weighted. 3. Receipt format 3 - Symbols line. First line contains text. Second line contains weight/multiplier, unit/item price and total price. 4. Receipt format 4 - Each transaction contains its own symbols line 5. Receipt format 5 - USA receipt format. Identical to format 1 except that 'X' and 'Items' are replaced by '@' and 'pc' for non weighed, and the '@' symbol is printed just before price/kg for weighed goods. 6. Receipt format 6 - Australian receipt format. Identical to format 5 except the description is not allowed to encroach into the total prices column.			
7	**Condensed format**			
	0. Disabled		1. Enabled	
8	**Change calculation**			
	0. Disabled		1. Enabled	
9	**Direct entry prepack**			
	0. Disabled		1. Enabled	
10	**Net weight**			
	0. Grams		1. Oz - lb/oz	
11	**USA total price legend**			
	0. Disabled		1. Enabled	
12	**Back calculation of unit price**			
	0. Disabled 1. Using net weight (France) by 100g		2. Using actual weight (Denmark) 3. Using net weight (France) by kg	
13	**NOT USED**			
14	**NOT USED**			
15	**Frequent shopper algorithm**			

Bank 4	
Digit	
	0. Compute frequent shopper price from printed weight 1. Compute frequent shopper price from back-calculated weight 2. Compute frequent shopper price from saving and back-calculated weight
16	**Not used**

5.6 Calibration

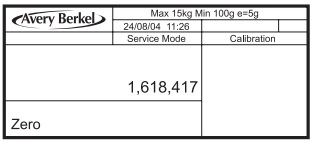
Calibration procedure

1 Ensure you are in full service mode - see page 38.

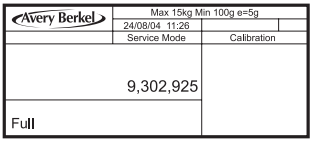
2 Select **Calibration** from the available options.

3 If the site and factory gravity factors differ, then you will be prompted to enter the factory gravity factor. Refer to the local authority for details. Use the left/right arrows to set the decimal point.

4 Calibrate with zero load.
Ensure there is no weight on the machine, then press ENTER.



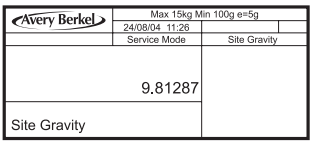
5 Calibrate with full load.
Place a full load on the machine, then press ENTER.

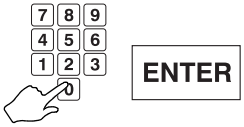


Note: the last 3 digits will be unstable.

5.7 Site gravity

If the machine has been moved to a different gravity zone, enter the site gravity compensation factor. Refer to the local authority for details





Note: *This is the gravity factor for the location where the machine is to be used.*

5.8 Service PIN

You can change the four digit restricted service access PIN from this menu. Only change the PIN if you think that the user knows the service PIN and is tampering with the machine's configuration.

5.9 Euro setup menu

5.9.1 Euro rate and Euro symbol

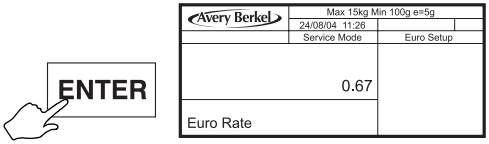
The Euro rate and symbol setup options are used to configure the Euro as a **secondary** currency

Euro Rate & Symbol Procedure

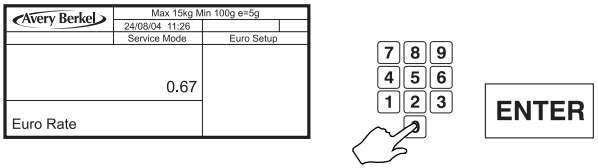
1 Ensure you are in full service mode - see page 38.

2 Select **Euro Setup** from the available options.

3 Press ENTER to select **Euro Rate**.

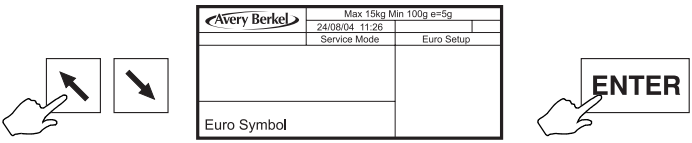


4 Enter the required value for the Euro currency.

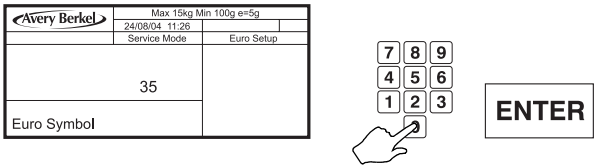


Note: Use the 'Previous / Next' arrows to position the decimal point.

5 Use the 'Previous / Next' arrows to select **Euro Symbol**.



6 Enter the value of the Euro Symbol.
35 = € (See configuration bank 2, digits 5 & 6 for details)



5.9.2 Euro wizard

This converts the PLU file from local currency to euro currency. The scale will then use the Euro as its **primary currency**.

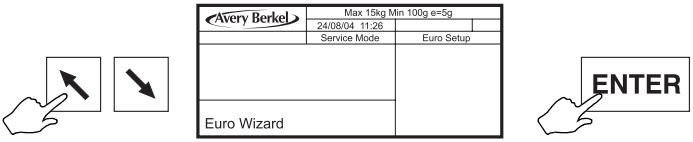
CAUTION: Only a factory reset can undo this operation.

Euro Rate & Symbol Procedure

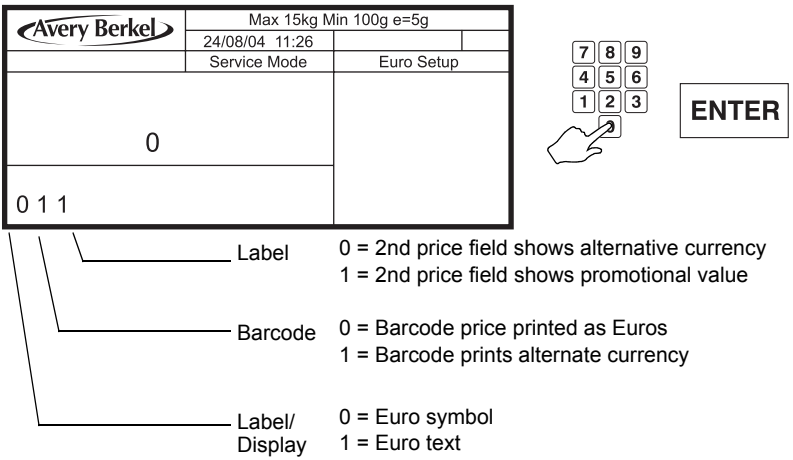
1 Ensure you are in full service mode - see page 38.

2 Select **Euro Setup** from the available options.

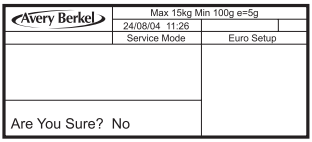
3 Use the 'Previous / Next' arrows to select **Euro Wizard**.

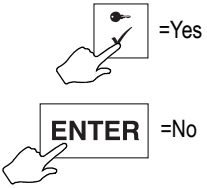


4 Set how the Euro will appear on the display / labels.



5 Select Yes or No to complete the process.





5.10 Clone machine

This function allows you to update another machine so that it is functionally identical to the one you are using.

The clone function will copy the following information:

- Executable files (application program)
- PLU file
- Label formats
- Logos
- Configuration and keyboard layouts

Note: *Machine specific information is excluded. (e.g. capacity, calibration data or gravity compensation factors).*

Network ID restrictions

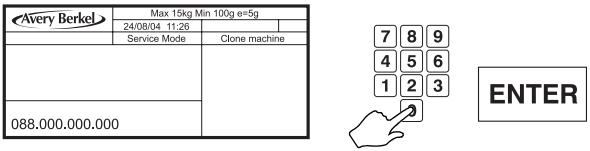
- Application program - can be cloned irrespective of the network IDs of the two machines.
- Data - can be cloned only if both machines are using the same network ID

For more information see *Network ID* on page 144.

Clone procedure

1 Ensure you are in full service mode - see page 38.
2 Select **Clone Machine** from the available options.

3 Enter the IP address of the target machine.



5.11 Data clone

Data clone allows you to transfer all the data in one machine to another machine (or machines) on the network.

The data clone function will copy the following information:

- PLU file
- Label formats
- Logos
- Configuration and keyboard layouts

Network ID restrictions

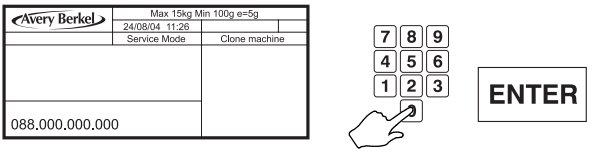
- Data - can be cloned only if both machines are using the same network ID

For more information see *Network ID* on page 144.

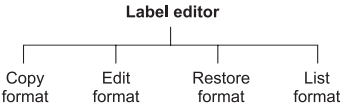
Clone procedure

1 Ensure you are in full service mode - see page 38.
2 Select **Data Clone** from the available options.

3 Enter the IP address of the target machine.



5.12 Label editor menu



The scale has 100 (0-99) label formats. This menu allows the label formats to be edited as required.

Note: *The maximum printable area on a label is 160mm x 60mm.*

Copy Format

Copy format allows you to create an identical copy of an existing label format. The copy can then be modified using the Edit Format option (see below).

Edit Format

This allows you to edit the label formats.

At any time you may:

- Use the ‘List Format’ function to print the current settings.
- Use the ‘Test’ key to print a sample layout.

5.13 Label editor menu

This menu allows you to create and edit up to 100 label formats. Each label can have up to 26 fields on it.

Copy Format

This menu allows you to create an identical copy of an existing label format. The copy could then be modified using the Edit Format option (see below).

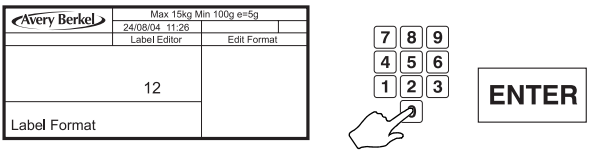
Edit Format

This menu allows you to edit the fields that appear on the selected label.

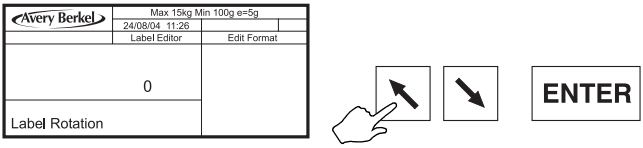
Note: *Use the `List Format' function to print the current settings.*

1 Ensure you are in full service mode - see page 38
2 Select **Label Editor** from the available options.
3 Select **Label Editor** from the available options.
4 Select **Edit Format**.

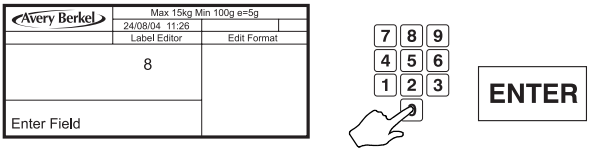
5 Enter the number of the label format to be edited. (e.g. 12).



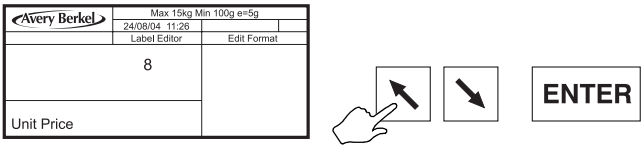
6 Use 'Previous' or 'Next' arrows to select the angle of rotation for the text & graphics on the label.



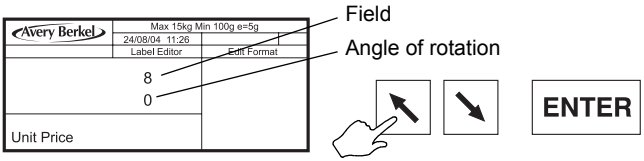
7 Enter the number of the field to be edited. (e.g. 8).



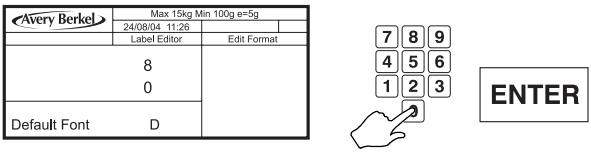
8 Use ‘Previous’ or ‘Next’ arrows to select the information that field is to display. (e.g Unit Price).



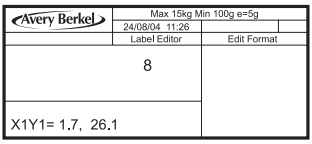
9 Use ‘Previous’ or ‘Next’ arrows to select the angle of rotation for the selected field.

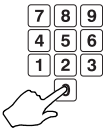


10 Enter the number (or letter) for the font to be used.



11 Enter the X1 and Y1 distances in mm (See field positioning XX)
(Use 'Previous' and 'Next' arrow keys to select between X1 & Y1).

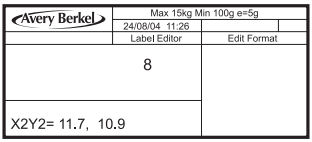




ENTER

X1 = distance from left
Y1 = distance from top

12 Enter the X2 and Y2 distances in mm (See *Field position notes* on page 67)
(Use 'Previous' and 'Next' arrow keys to select between X2 & Y2).



ENTER

X2 = distance from right
Y2 = distance from bottom

To print a test label

To save and exit

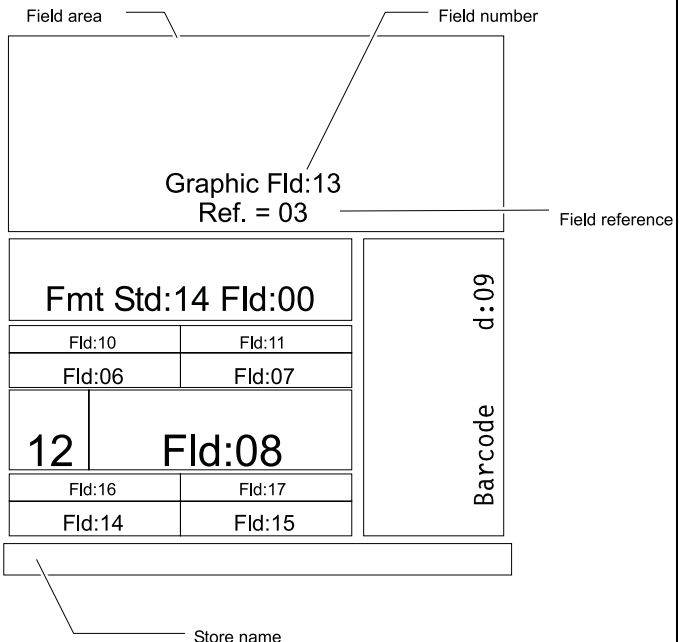
To exit without saving

Shift **ENTER**

To move to the next field

ENTER

Typical test print

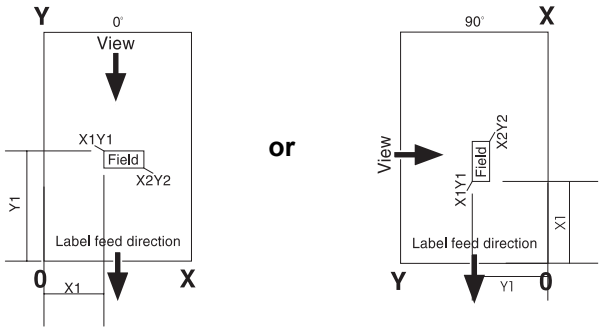


USR - User defined field
STD - Standard default label format

Field position notes

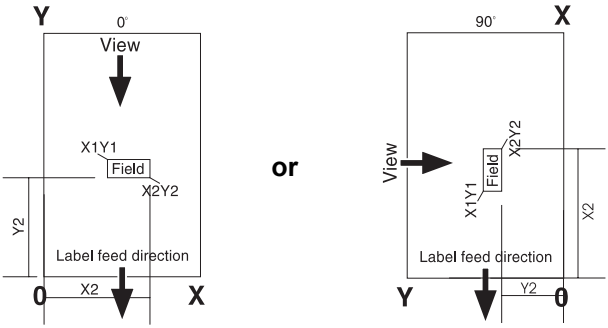
The position of the fields on a label are set by a bounding box. This uses the distances X1, Y1, X2, Y2; illustrated as follows.

X1 & Y1



Field rotation 0° Field rotation 90°

X2 & Y2



Field rotation 0° Field rotation 90°

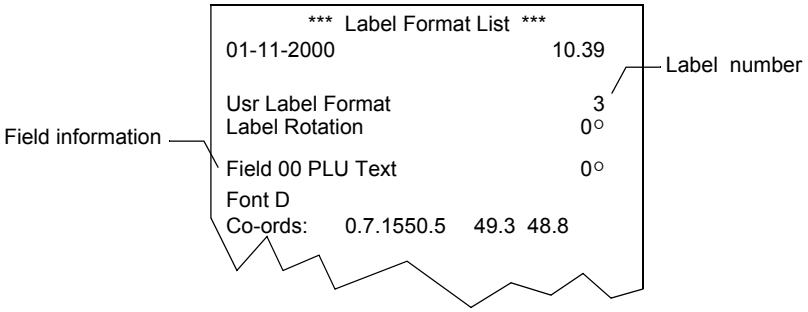
Note: *The distances are entered for the direction in which the label is being viewed.*

Restore Format

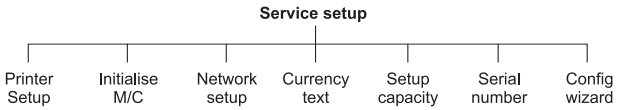
This option allows you to restore the specified label format to its factory default.

List Format

This option will print out details about all the fields that are used on the specified label format.



5.14 Service setup



Printer setup

Do not adjust these settings unless there is a problem with the printer.

Density
This allows you to set the print density on the print out.

1 = light
9 = dark (default = 5).

If the print quality is poor check that the print head is clean. Poor quality printing can be caused by using inferior quality paper.

Note: *For machines with two printers, set the print density for the receipt (second) printer using the Printer 2 menu option.*

Printhead life
This is for factory testing purposes only.

Sensor distance
This allows the parking position distance to be adjusted (mm). Default setting is 48.5mm

Label threshold (10 - 250)
Set the sensitivity of the label gap sensor.

10 = Very sensitive to gaps between labels.
250 = Not very sensitive to gaps between labels.
Default value = 50

Paper threshold (10 - 250)
Set the sensitivity of the paper sensor.

10 = Very sensitive to presence of paper.
250 = Not very sensitive to presence of paper.
Default value = 100

Initialise M/C

This allows you to:

- Restart the machine
- Set up the memory allocations.

The options are:

Warm restart

This is the equivalent of switching off the machine and then switching on.

Cold Start

This will restart the machine and clear all the battery-backed RAM. This will delete **ALL** records except:

Service PIN	Sub net mask
Label formats and logos	Gateway IP address
Configuration banks	Modem enable/disable
Euro rate	Print density
IP address	Distance from sensor
Advantage IP address	LCD contrast
Network ID	Diagnostic log size
Host port number	
Calibration and gravity factors	
Number of receipts and transactions	

Factory reset

USE WITH CAUTION!

This will restore the machine to its factory default settings.

This will delete **ALL** records except for the MAC (Media Access Control) address, calibration constants, gravity factors and bank 1, digit 1 of the machine configuration.

Factory reset values

IP Address	Reset to 88.200.100.5
Network ID	Reset to 0
Host port number	Reset to 3001
Sub net mask	Reset to 255.0.0.0
TCP/IP Gateway Address	Reset to 0.0.0.0 (disabled)
Advantage IP Address	Reset to 0.0.0.0 (disabled)
Logos	All (user logos) deleted
Label formats	Reset to default settings
Calibration	Unchanged
Gravity	Unchanged
Configuration banks	Reset to default settings except for digit 1 bank 1
Euro conversion rate	Reset to 1.00
Print density	Reset to 5
Number of receipts and trans.	Reset to 20 receipts and 8 transactions
Distance from sensor to printhead	Reset to 48.5mm
LCD contrast	Reset, but no change until machine is switched off and on.
Modem on/off	Reset to disabled
Modem initstring	Reset to ATM0S0=1V1X4&K3&D0↵
Service PIN	Reset to 9467
Diagnostic log size	Reset to small
Audit mode	Enabled
Distance printed (mm)	Reset to zero

Delete File

This will delete the PLU file.

Set Trans Memory
(Set transaction memory/transaction storage).

This allows you to set the amount of memory allocated for transactions and receipts.

See *Memory setting guidelines* on page 73.

Set Accounts memory

(0-999) Set the maximum number of customer accounts which can be used.

Set Trac Memory

Set the traceability storage capacity

- Number of panels: 0-9999
- Number of totals records: 0 - 9999

For more information on traceability see the separate user instruction books.

Network Setup

Allows you to select the ethernet connection speed.

- **10 BaseT Fixed.**
  The scale will be fixed to a 10Mbit connection speed.
- **10/100 BaseT Auto.**
  The scale will auto select either 10Mbit or 100Mbit connection speed, depending upon the network capability.

See also *Networks* on page 137.

Currency text

The user defined currency text is 3 digit field that can be used instead of the default currency text (as set in config bank 2 digits 5 & 6). See *Configuration tables* on page 45 for more information.

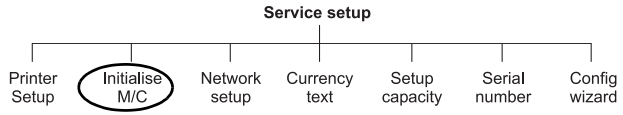
Note: To use this user defined currency text, set config bank 2 digits 5 & 6 to 00.

5.15 Memory setting guidelines

Note: *Changing memory settings will induce a cold start and should therefore be done* ***before*** *other (customer) data is set.*

5.15.1 Set Trans Memory

(Receipt and transaction memory)



Each machine will store transactions according to the '**Set Trans Memory**' option (selected from within the 'Initialise M/C menu).

You can set the following:

- **Num Receipts (Default = 20)**
  The max number of receipts stored.
- **Num Trans / Recpt**
  (Default = 8, Max = 99)
  The max number of individual transactions stored for each receipt.

Audit settings

The Trans memory required is closely associated with the Audit settings defined within manager mode. See the separate user instructions and manager menus sheets for more information.

Trans memory - Client machines

The memory allocated should reflect the requirements of the installation.

Example settings 1 - Label

Example scale requirements:

50 labels per hour (1 transaction per label)
8 hours trading required in local mode (network fail)

Memory requirements would be:

Num Receipts = 400
Num Trans per receipt = 2

Example settings 2 - Receipt

Example scale requirements:

20 receipts per hour
Average of 4 transactions per receipt
8 hours trading required in local mode (network fail)

Memory requirements would be:

Num Receipts = 160
Num Trans per receipt = 4

Trans memory - Server machines

Settings notes 1 - Single servers

For a server, receipts are only stored when live (prior to being totalised). Consequently, the maximum number of receipts stored will be the same as the number of operators using the system at any one time.

Example server requirements:

20 operators on system
Up to 100 live transactions at any one time
(assume equal split between operators)

Memory requirements would be:

Num Receipts = 20
Num Trans per receipt = 5

This would also limit the largest receipt, on the system, to 100 transactions (i.e. 20 x 5).

Note: *If an audit trail is required, the number of receipts and transaction stores should be set according to the length of trail required*

Settings notes 2 - Dual servers

- **Linear / Circular Buffer**
  The server buffer can be set to either linear or circular.

  Manager mode >> Audit >> Server buff mode

  Set to linear - If totals and/or audit trail integrity is vital.

  The number of receipt stores and transaction stores, will then determine how long trading can continue before an ***audit full*** condition is reached.

  Set to circular - If the ability to continue trading is more important.

  The number of receipt & transaction stores will then dictate after how long information will start to be overwritten.

  The buffer type is set within manager mode. See the separate user guide (part 2) for more information on circular / linear buffers.

See the separate User guide (part 2) for more information.

Consolidation of dual servers

When communications between dual servers breaks down, both will continue as servers, potentially with clients. As trading continues on both, totals, receipts and transactions will be generated. When the servers are reunited, transactions and receipts will be consolidated, so that both servers will now have a complete set of receipts and transactions. Totals data will not be collected. It will be regenerated from the receipt and transaction data. NB For server consolidation, audit mode must be enabled.

6 Service procedures

6.1 Power up / Power down

6.2 Calibration

6.3 Top cover and cross

6.4 Left cover

6.5 Rear cover (M100)

6.6 Customer display chassis

6.7 Front cover / vendor displays

6.8 Column mounting (M200, 300, 400)

6.9 Main board

6.10 Installing expansion boards

6.11 Loadcell

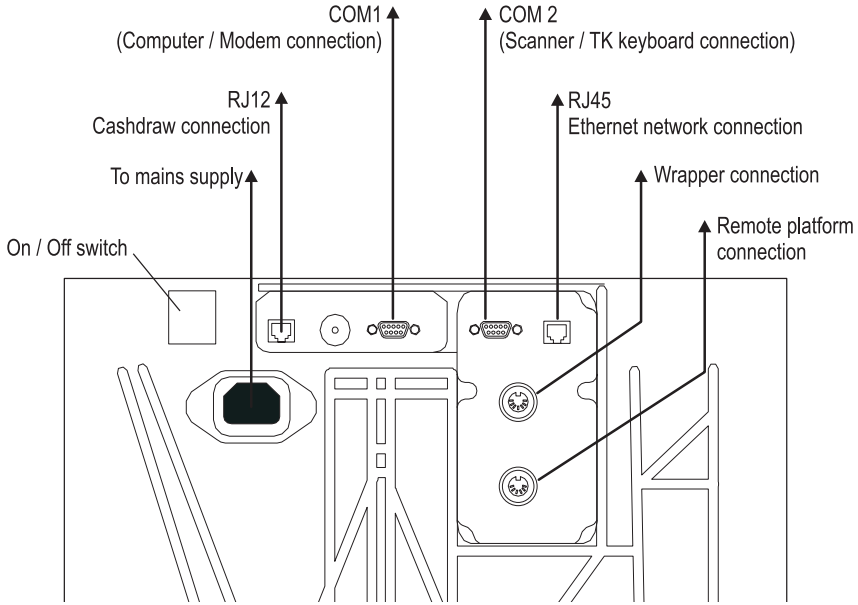
6.12 Power supply

6.13 I/O board and chassis

6.14 Printer servicing

6 Service procedures

6.1 Power up / Power down



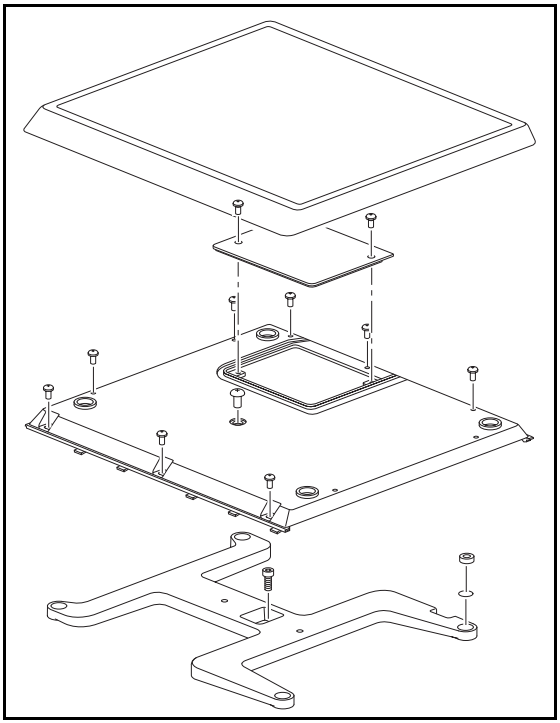
Service notes:

- Power up / down using the switch shown above.
- **CAUTION**: Even when the unit is switched off, mains voltage is still present inside the unit.

6.2 Calibration

For the calibration procedure see *Calibration* on page 54.

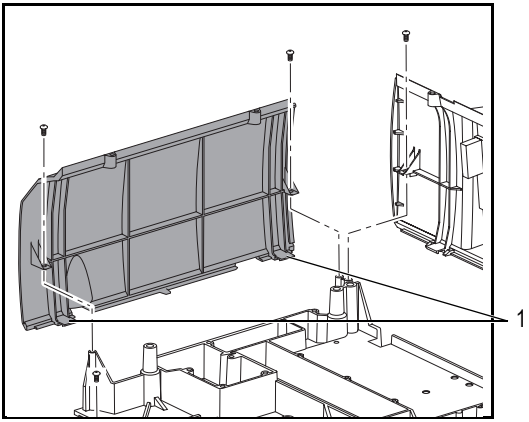
6.3 Top cover and cross



Service notes:

- Open the print door before removing the top cover.
- Top cover is secured by 9 screws, one of which is covered by a security seal (self adhesive label).

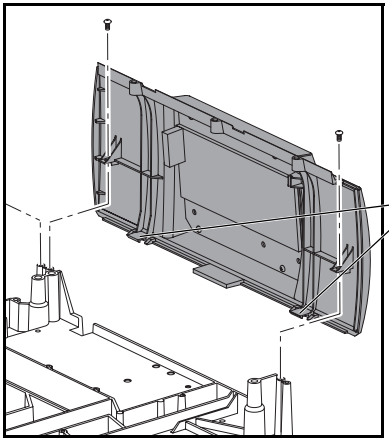
6.4 Left cover



Service notes:

- Removal of the left cover allows access to I/O board. It is held in place between the front and rear (display) covers and secured by 2 screws.
- When removing the cover, lift the retaining tabs (1) from the underside of the scale, using a screwdriver.

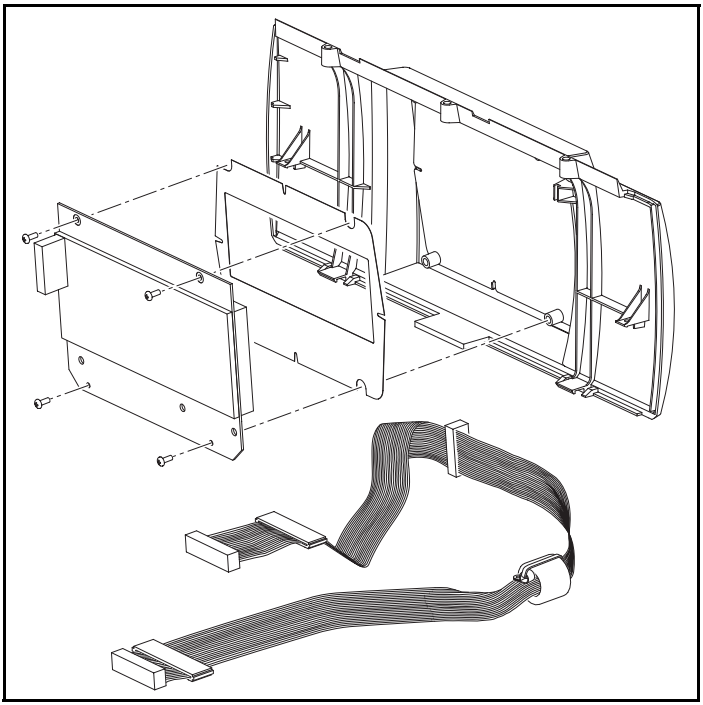
6.5 Rear cover (M100)



Service notes:

- In order to access the customer display, it is necessary to remove of the rear cover.
- Secured by 2 x screws.
- When removing the cover, lift the retaining tabs (1) from the underside of the scale, using a screwdriver.
- Scales with tower displays have a different rear cover. However, its position / fastening are the same.

6.6 Customer display chassis

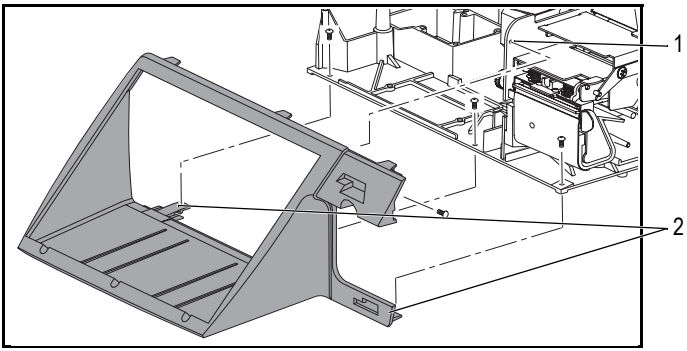


Service notes:

- The customer display forms the rear cover. See page 83.
- See *Display PCB* on page 128, for display hardware information.

6.7 Front cover / vendor displays

6.7.1 Front cover (nose cone)

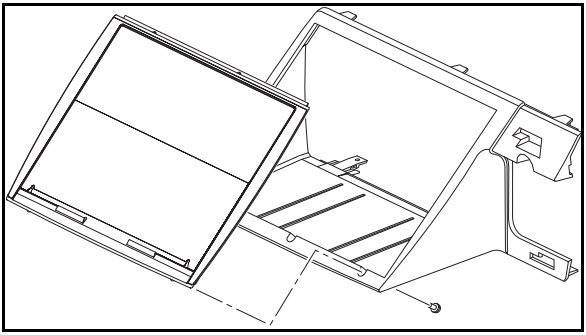


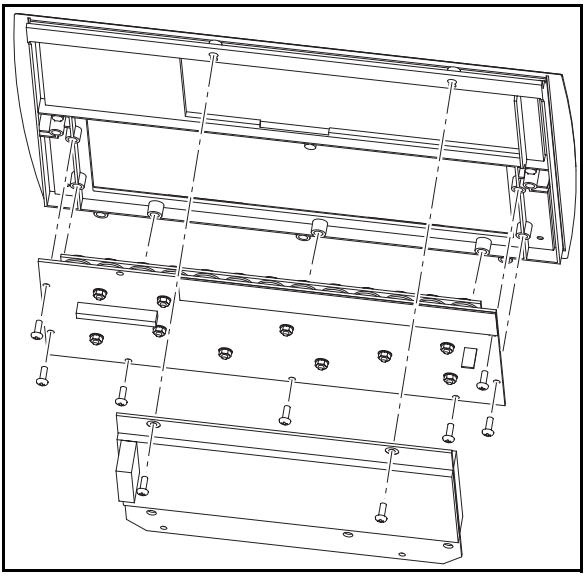
Removal of the front cover allows access to the vendor display and keyboard.

Service notes:

- When removing the front cover, slacken the screw (1) securing it to the printer chassis. There is no need to remove this screw.
- When removing the cover, lift the retaining tabs (2) from the underside of the scale, using a screwdriver.

6.7.2 Vendor display & keyboard





Service notes:

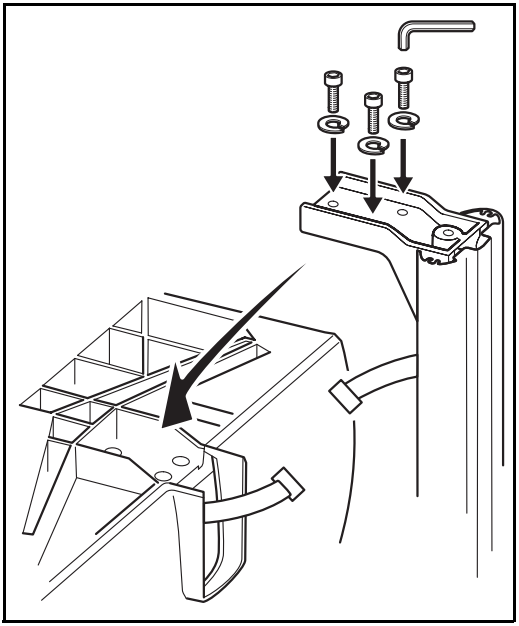
- Remove the front cover for access to the display and keyboard PCBs. See page 85.
- The keyboard is secured with 7 x sems screws
- When replacing the assembly enure that you connect the earth braid between the display assembly and I/O chassis.

Replacing a key switch

Defective switches on a keyboard may be replaced as follows:

1. Carefully remove the cover plate retaining the floating buttons in their recesses.
2. De-solder the defective switch and remove it taking care not to damage any tracking.
3. Fit the new switch taking care not to damage the legs and solder it in place.
4. Replace the cover plate and floating buttons.

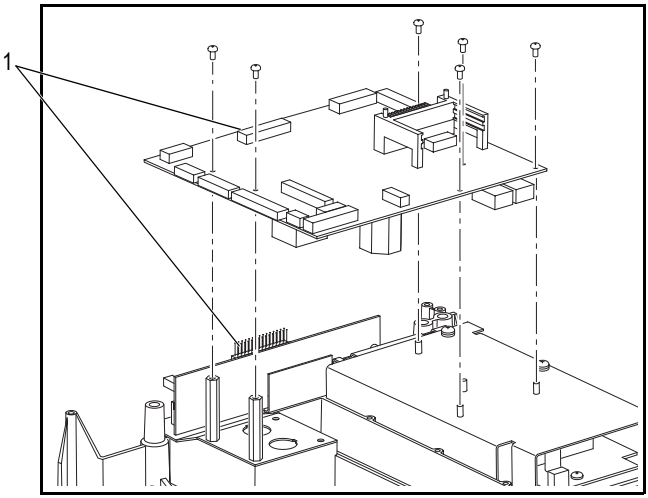
6.8 Column mounting (M200, 300, 400)



Service notes:

- The column is held in place by 3 x socket screws into the base of the scale.
- Disconnect all appropriate looms before attempting to remove the column.
- 2 Piece loom (as shown). - M300 only.
- M400. It is advised that the display pod is removed from the column, before attempting to attach or remove the column from the scale body. The display / column assembly is top heavy when separated from the scale body.
- When replacing looms, thread them through from the top of the column.

6.9 Main board

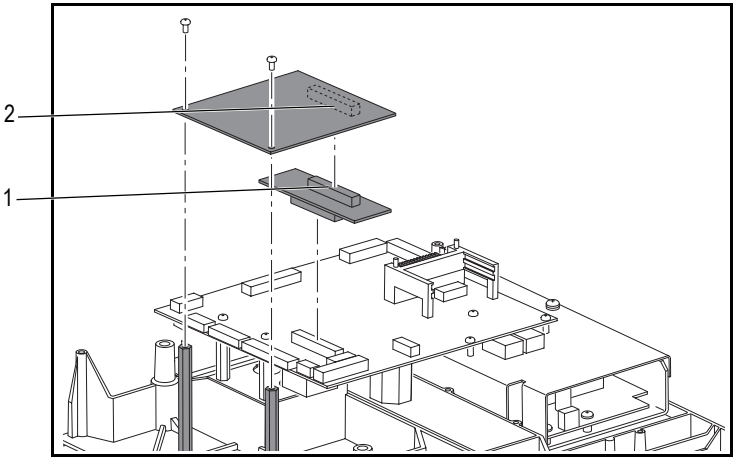


Service notes:

- Remove top cover and cross to access.
- The board is secured with 6 x M3(sems) screws.
- The main board mates onto the I/O PCB via the connectors (1) shown.
- For hardware details see *Main board* on page 123.

6.10 Installing expansion boards

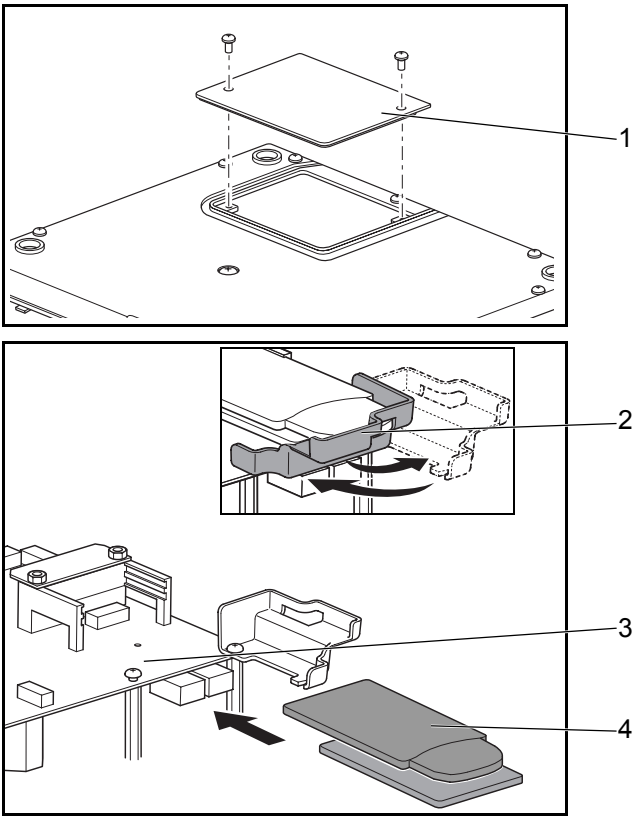
6.10.1 Installing a RAM expansion PCB



Service notes:

- Make sure that all PLU files label formats etc. are copied to another machine before adding (or removing) a RAM expansion card.
- (1) Adaptor, fits onto main board.
- (2) RAM expansion, fits onto adaptor.

6.10.2 WLAN (RF) PCB



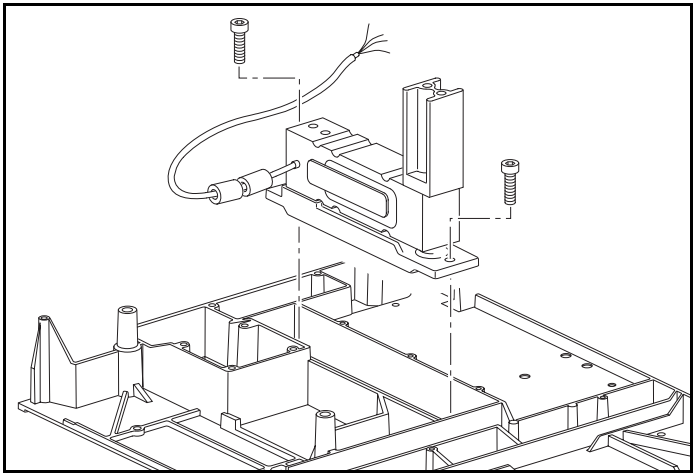
Service notes:

- Ensure scale is switched off. This board is not suitable for ‘hot’ connection.
- The RF PCB can be accessed through the inspection cover (1).
- Screw (3) is used to secure the retainer clip.
- Plug the WLAN PCB (4) into the PCMCIA cradle (2).

Configuration

For configuration of a WLAN network, refer to the separate “Manager functions” book.

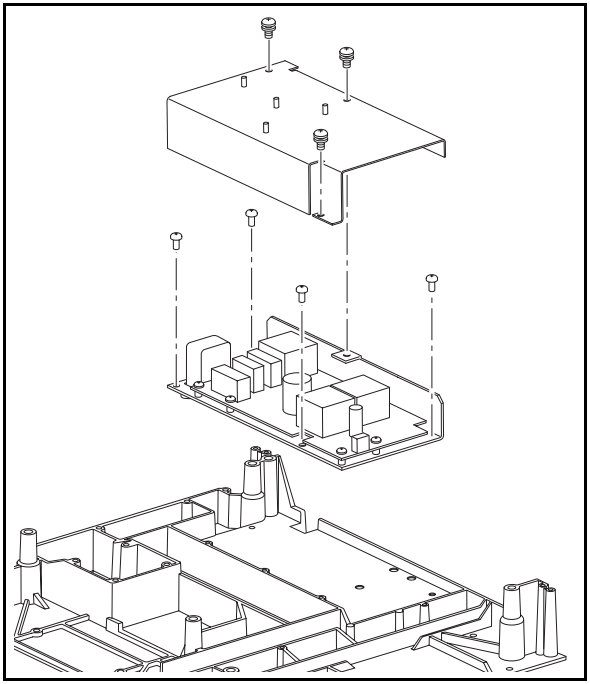
6.11 Loadcell



Service notes:

- Remove top cover, cross and main board for access. See page 81.
- For connection details see *Loadcell terminations* on page 119.

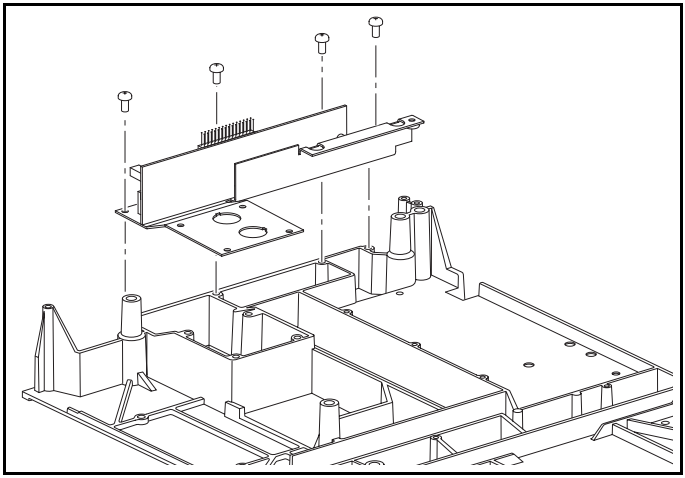
6.12 Power supply



Service notes:

- Ensure scale is isolated from mains supply when servicing the power supply.
- Remove top cover, cross and main board for access. See page 81 and page 89.

6.13 I/O board and chassis

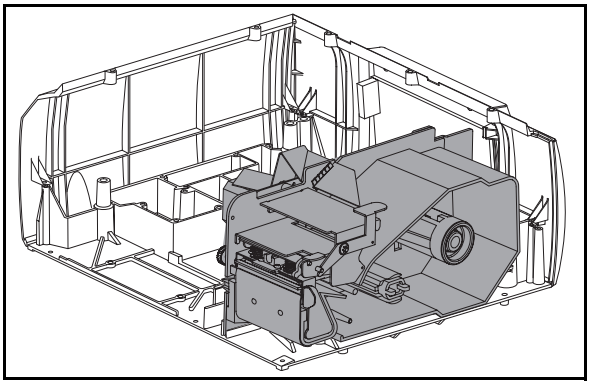


Service notes:

- Remove the top cover and cross (page 81), main board (page 89) and power supply cover (page 93) for access to the I/O board.
- For hardware details see *I/O board* on page 132.

6.14 Printer servicing

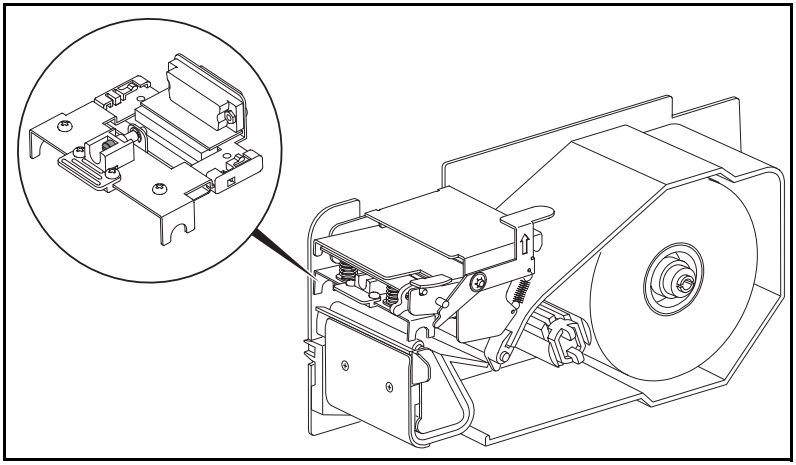
6.14.1 Printer chassis and cassette



Service notes:

- To remove/replace the full printer chassis, first slacken front and rear covers.

6.14.2 Print head replacement

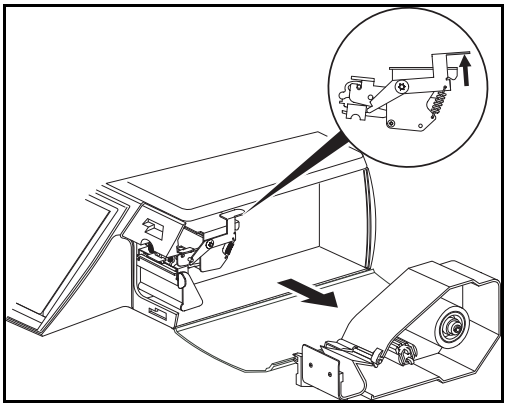


Service notes:

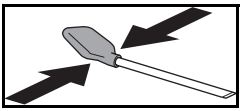
- Ensure power is turned off
- Raise print head and remove printer cassette before replacing the print head.
- Print head is secured by 1 x screw (1)
- Print head plugs into print assy via the 15 way d socket shown above.
- Ensure cassette is replaced and print head locked down after replacement.

6.14.3 Cleaning the print head

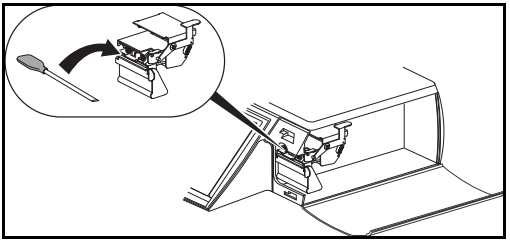
1 Raise the print head and remove the cassette

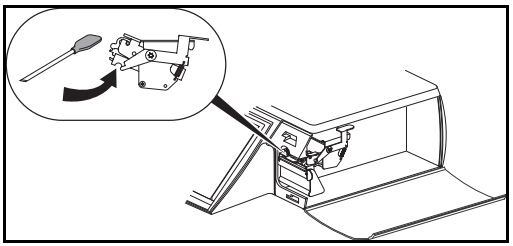


2 Snap the cleaning swab.

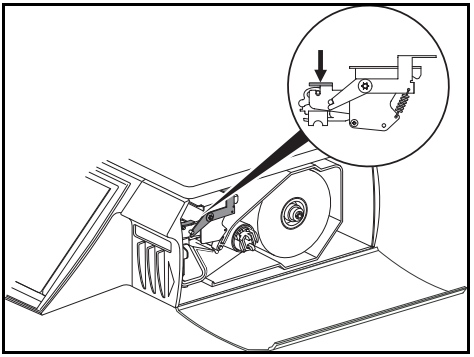


3 Clean the print head and roller**l**.





4 Replace the cassette and lower the print head



For more detailed instructions refer to the separate operator instructions.

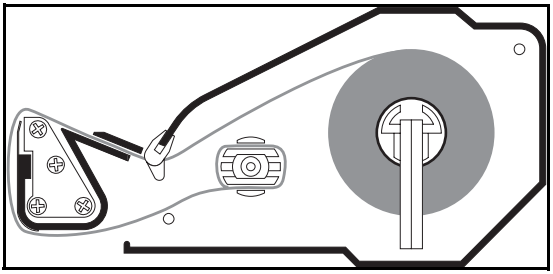
Service notes:

- Ensure power is off when cleaning the print head.

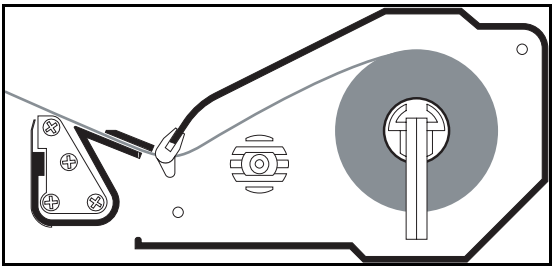
6.14.4 Paper routes

Label / receipt paper routes are as shown.

Label paper route



Receipt paper route



For more detailed instructions refer to the separate operator instructions.

Service notes:

- Ensure cassette is replaced and print head locked down after replacing paper roll.

7 Exploded views

7.1 M100 Scale body

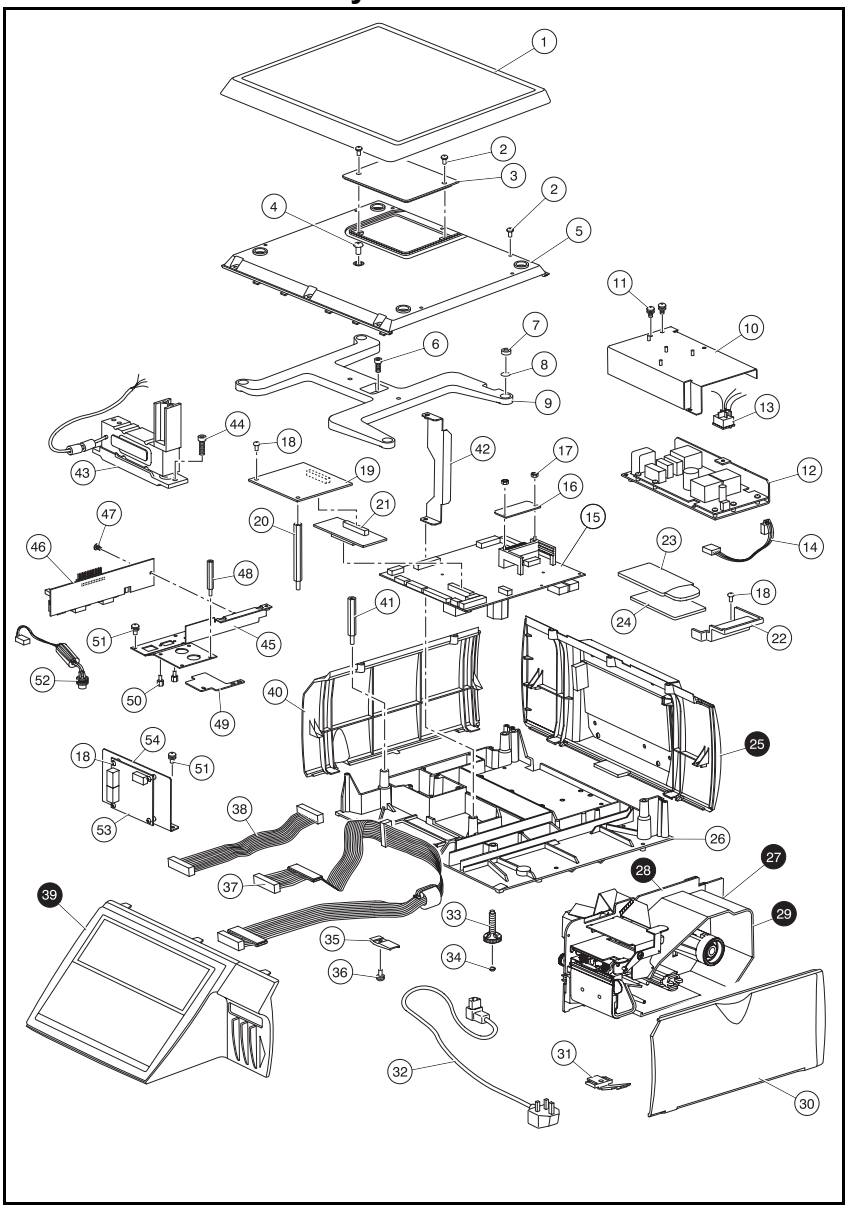
7.2 M100 Vendor display assembly

7.3 M100 Customer display assembly

7.4 Cassette printer assembly

7 Exploded views

7.1 M100 Scale body

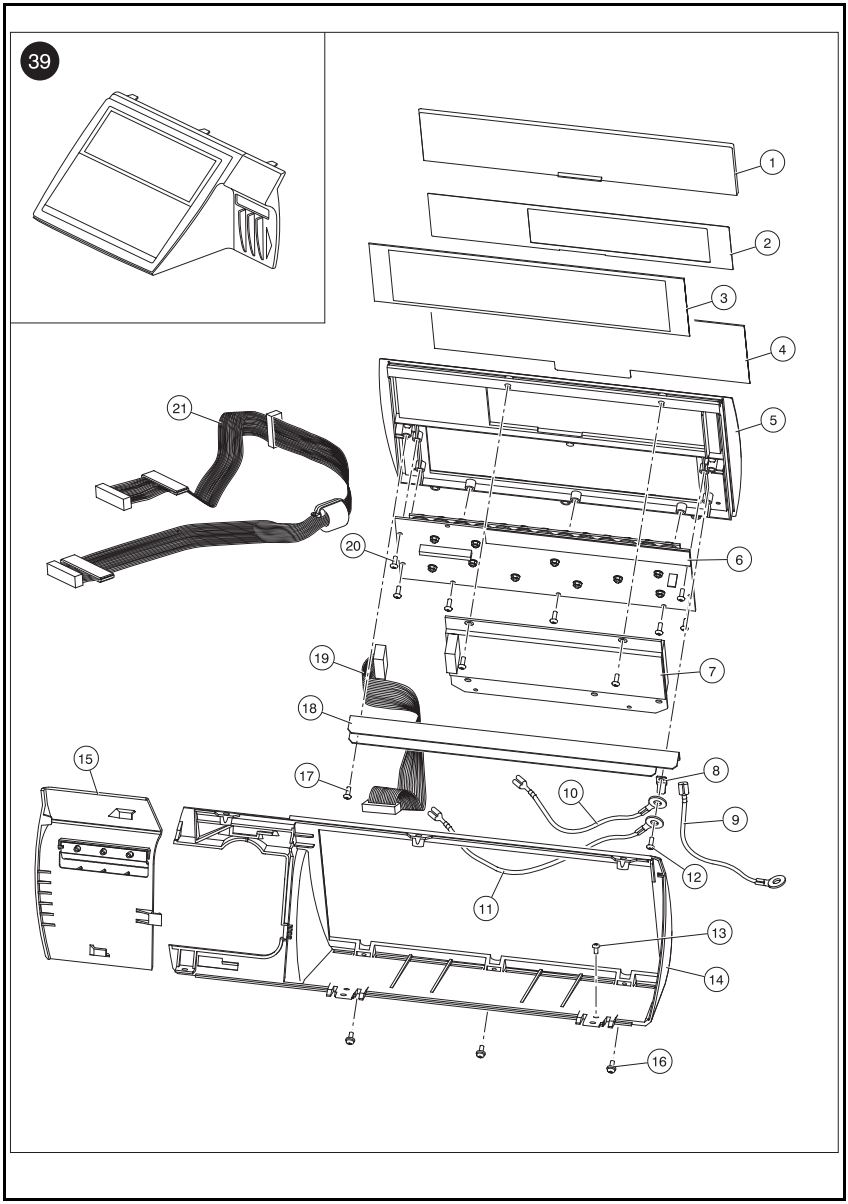


M100 Scale body

Annotation	Description
01	WEIGHPAN
02	M3 X 8 REC PAN HD MS SCR BRZN:
03	ACCESS PANEL
04	M4 X 8 REC PAN HD MS SCR BRZN:
05	TOP COVER
06	M6 X 20 SKT HD CAP SCREW NATUR
07	CROSS RUBBER:
08	CROSS RUBBER ADHESIVE PAD
09	CROSS
10	PSU COVER (M2 SERIES)
10	SWITCH MODE PSU COVER WARNING
11	M4X8 REC PAN HD SCREW (SEMS)
12	M2 SERIES PSU ASSY
13	LOOM:MAINS SWITCH
14	POWER LOOM
15, 16, 17	MAIN BOARD ASSEMBLY
18, 22, 23 & 24	RF PCB KIT
19	MEMORY PCB
25	REAR CUSTOMER DISPLAY ASSY
25	LCD DISPLAY :M2 (FSTN VERSION)
25	CUSTOMER OVERLAY: M2
26	DIECAST BASE
27, 28, 29	PRINTER ASSY:M2
29/30?	PRINT HEAD WARNING LABEL
29/30?	PRINT HEAD ADJUSTMENT LABEL
30	PRINTER DOOR ASSY
31	LIVING HINGE

Annotation	Description
32	MAINS LEAD
33 & 34	FOOT ASSY
35	CABLE RETAINER
37	M2 DISPLAY LOOM
38	M2 KEYBOARD LOOM
39	BEZEL - MOSAIC
39	KEYMAT ASSEMBLY SMALL
39	DISPLAY STRAP
39	BEZEL WINDOW (ADHESIVE-BACKED)
39	LCD DISPLAY :M2 (FSTN VERSION)
39	FRONT K/BD & TICKET MOUTH ASSY
39	POCKET OVERLAY
39	KEYBOARD OVERLAY UK (PH2)
40	LH SIDE ASSEMBLY
43	T103 ASSY:15KG AVR
45	M2 I/O BRACKET
46	INPUT/OUTPUT PCB ASSY
49	I/O BLANKING PLATE

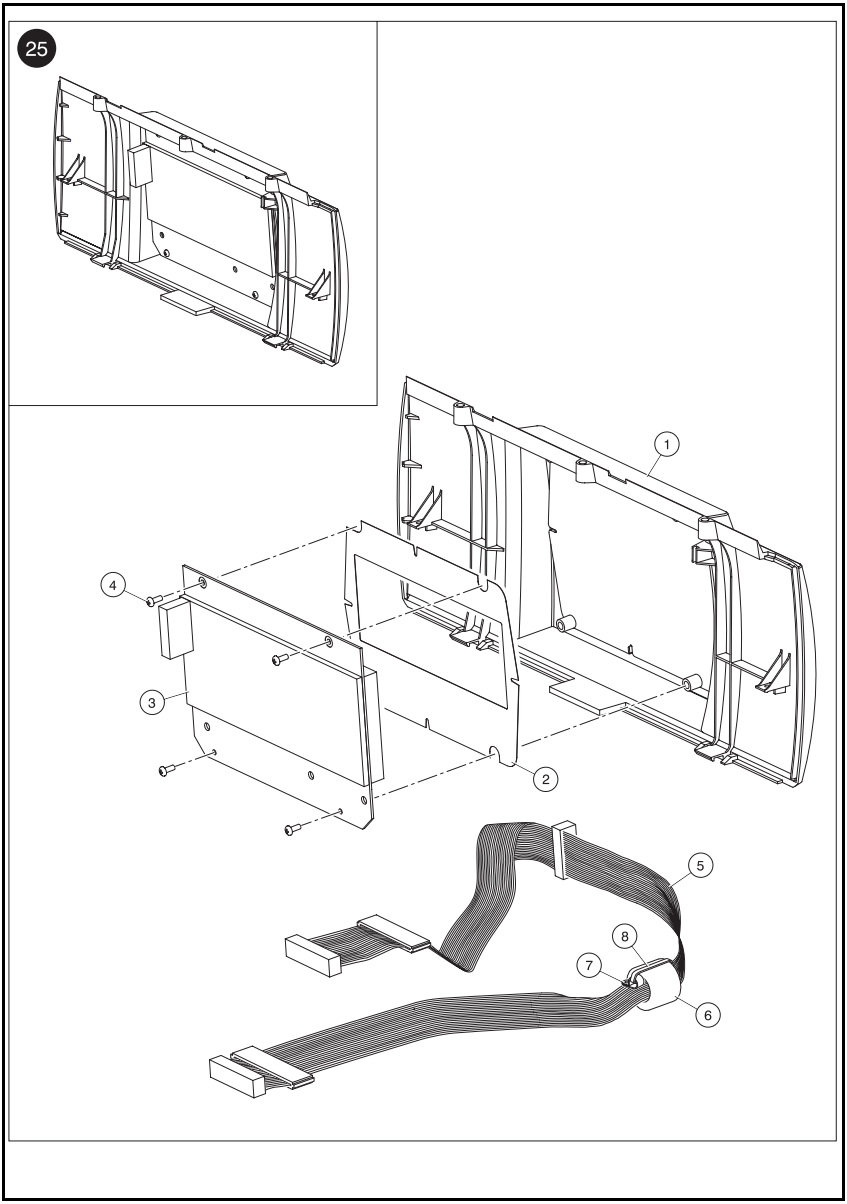
7.2 M100 Vendor display assembly



M100 Vendor display assembly

Annotation	Description
1	BEZEL WINDOW (ADHESIVE-BACKED)
2	VENDOR OVERLAY: M2
3	POCKET OVERLAY
4	KEYBOARD OVERLAY UK (PH2)
5	BEZEL - MOSAIC
6	KEYMAT ASSEMBLY SMALL
7	LCD DISPLAY :M2 (FSTN VERSION)
8	SINGLE `250` EARTH TAG:
9or10	EARTH STRAP
9or10	EARTH STRAP
14	FRONT KEYBOPARD AND TICKET MOUTH ASSY
16	M3x10 REC PAN HD SCR:INTEG STE
18	DISPLAY STRAP
19	M2 KEYBOARD LOOM
20	M3X8 REC PAN HD SCR (SEMS SPRI

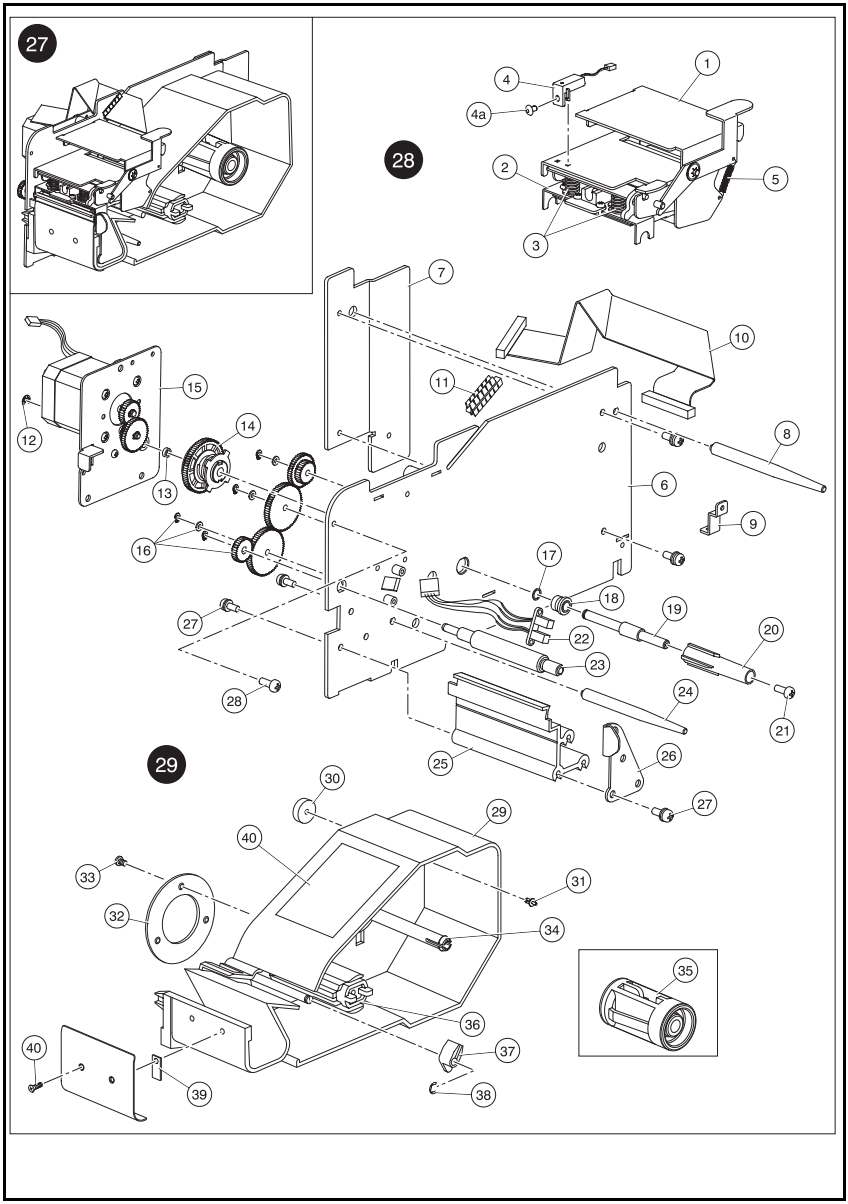
7.3 M100 Customer display assembly



M100 Customer display assembly

Annotation	Description
1	REAR CUSTOMER DISPLAY WINDOW
2	CUSTOMER OVERLAY: M2
3	LCD DISPLAY :M2 (FSTN VERSION)
4	M3X6 REC PAN HD SCR (SEMS SPRI

7.4 Cassette printer assembly



Cassette printer assembly

Annotation	Description
2	REMOVEABLE HEAD ASSY (PRINT HEAD ONLY)
3	SPRING KIT
4	LABEL TAKEN SENSOR
5	RETURN LEVER SPRING
14	CLUTCH ASSY
16	GEAR KIT + E & C RINGS
22	LABEL SENSOR LOOM
23	ROLLER
27	PRINTER ASSY
34	SPOOL SPLINE
35	LABEL ROLL HUB

8 Schematic / Wiring diagrams

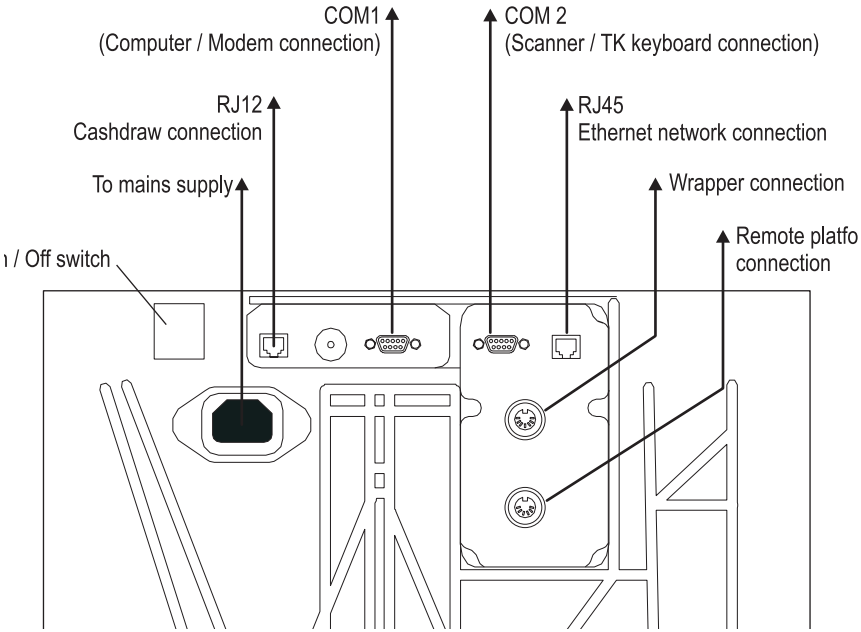
8.1 External connections

8.2 Internal connections

8 Schematic / Wiring diagrams

8.1 External connections

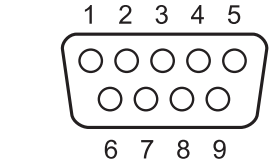
8.1.1 Overview



8.1.2 Scanner connection

The scanner should be connected to serial port 2

9 way D plug (front view)



Pin	Function
1	Not connected.
2	TX from scanner (scale input).
3	RX from scanner (scale output).
4	Not connected.
5	0V
6	Not connected.
7	Do not connect.
8	Do not connect.
9	5V supply from scale
Shell	GND

Serial settings as follows:

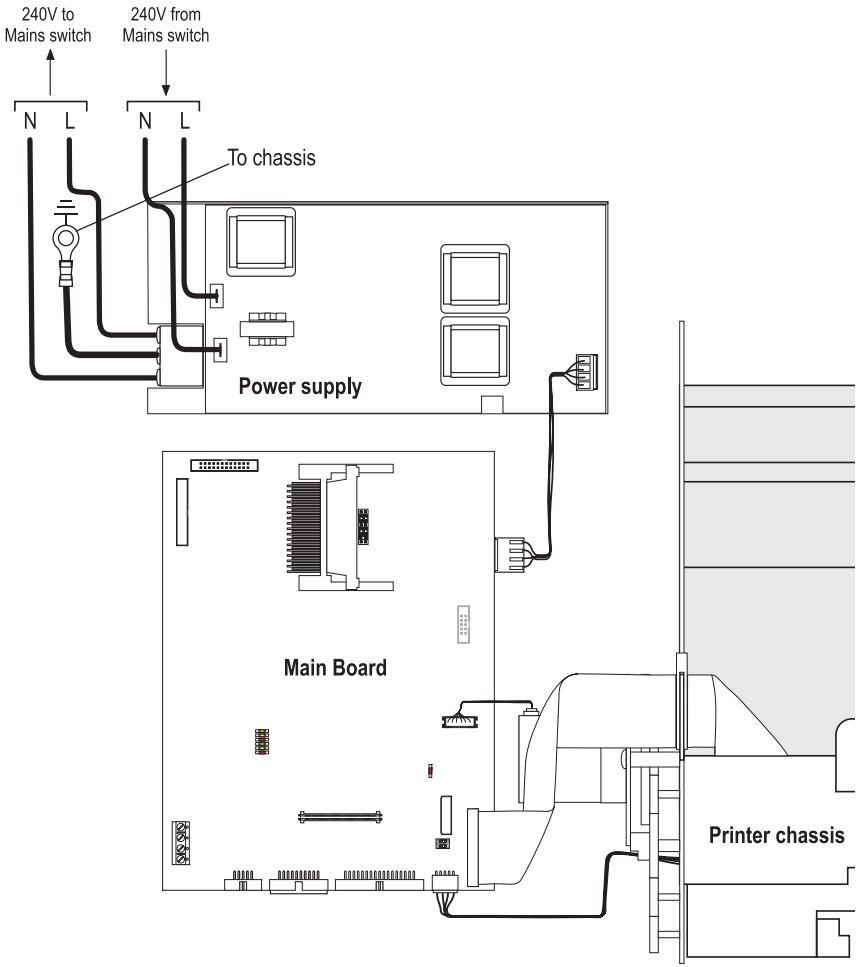
- 9600 Baud
- No parity
- 1 stop bit

The scanner must be configured to interpret EAN/UPC family barcodes or Code 39 barcodes. The type of barcode will depend on the application to be used.

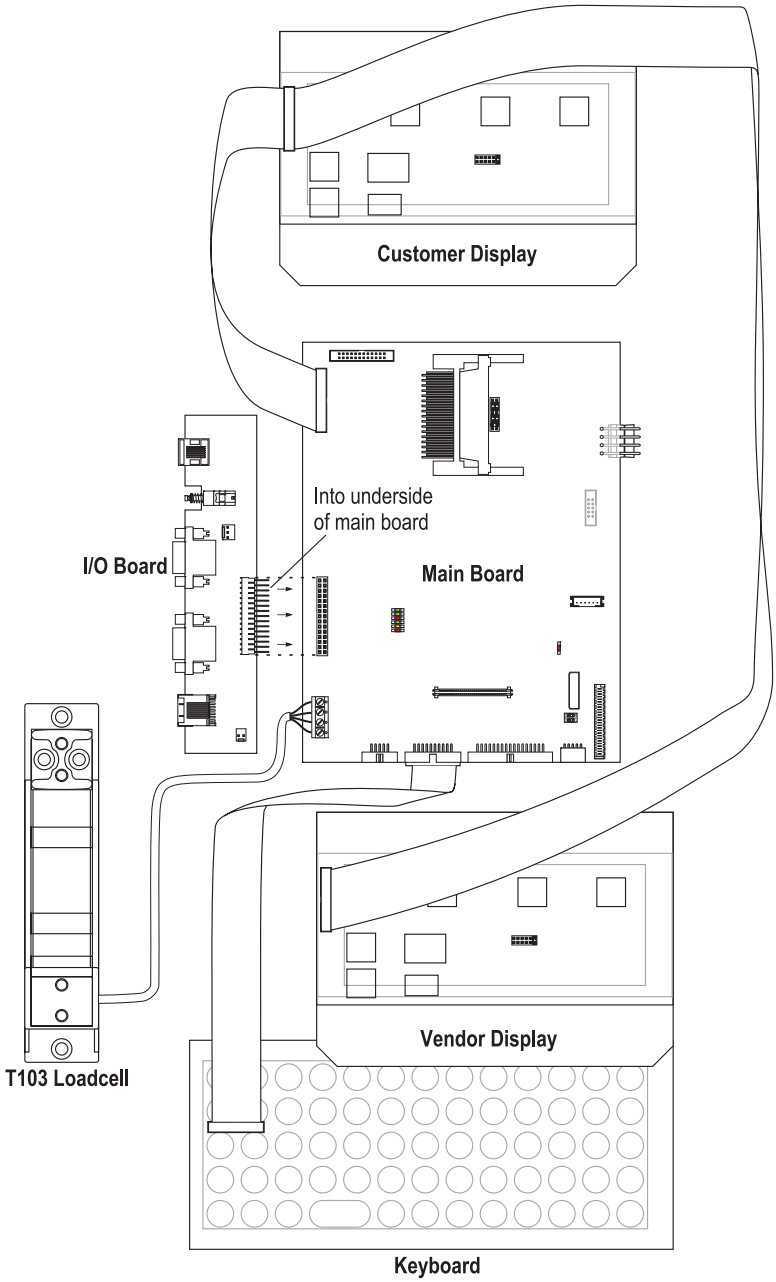
Refer to the instructions supplied by the scanner manufacturer for details on how to do this.

8.2 Internal connections

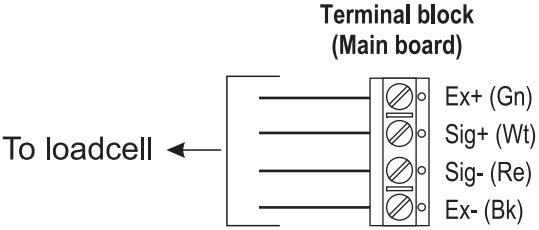
8.2.1 Power and printer



8.2.2 M100 loadcell, displays and keyboard



Loadcell terminations



9 Module information

9.1 Main board

9.2 Display PCB

9.3 Power supply

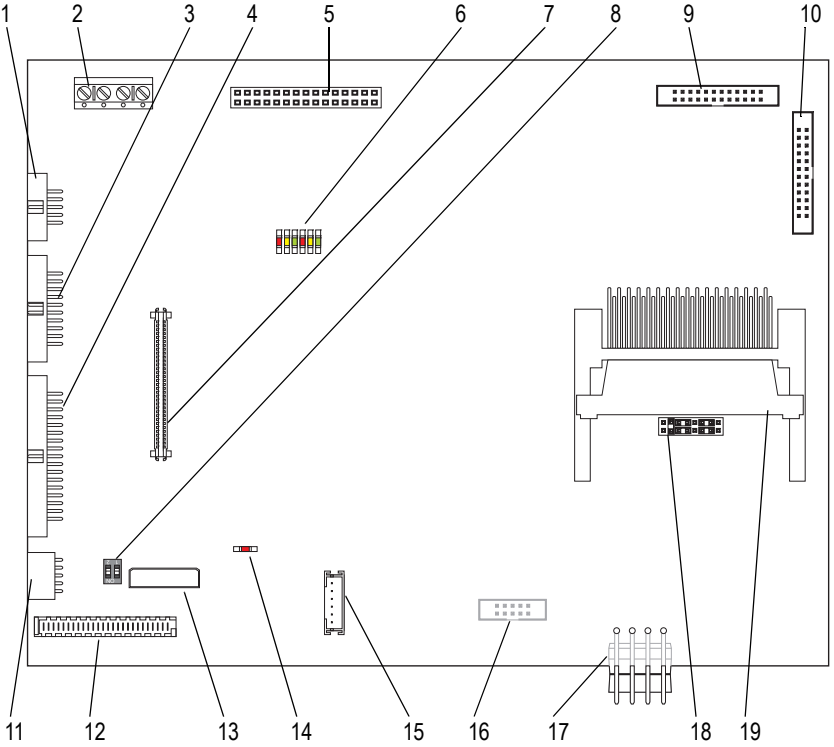
9.4 I/O board

9.5 T103 Loadcell

9 Module information

9.1 Main board

9.1.1 Module layout

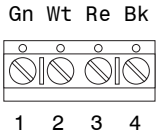


1. Connector - Loom to external platform interface
2. Terminal block - Loadcell connection
3. Connector - loom to standard keyboard
4. Connector - Loom to large keyboard
5. External I/O connection
6. LEDs - Network indications
7. Memory expansion connector.
8. Dip switch - Battery RAM & printer select

9. Connector - Loom to column mounted (customer) display
10. Connector - Loom to mono (customer/vendor) displays
11. Connector - Loom from print sense
12. Connector - printer data.
13. Connector - Clamshell printer (if 2nd printer)
14. LED - Heartbeat reassurance
15. Print step motor connector.
16. Not fitted
17. Power supply connector
18. Jumper links - Power configuration
19. PCMCIA - RF cradle

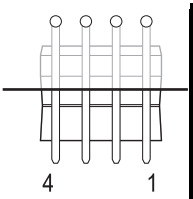
9.1.2 Pinouts

Load cell connector (2)



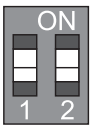
Pin	Function
1	Ex+ (Gn)
2	Sig+ (Wt)
3	Sig- (Re)
4	Ex- (Bk)

Power supply connector (17)



Pin	Function
1	0 V in
2	0 V in
3	+24 V dc in
4	+24 V dc in

9.1.3 Dip switch (8)



Setting	Function
1 = ON	Printer 1 is the Godex (cassette) printer
1 = OFF	Printer 1 is the Clamshell printer
2 = ON	Battery backed RAM is ON
2 = OFF	Battery backed RAM is OFF

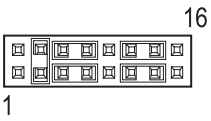
CAUTION: Failure to set the correct printer type will result in damage to the printhead.

9.1.4 Links

Power configuration links (18)

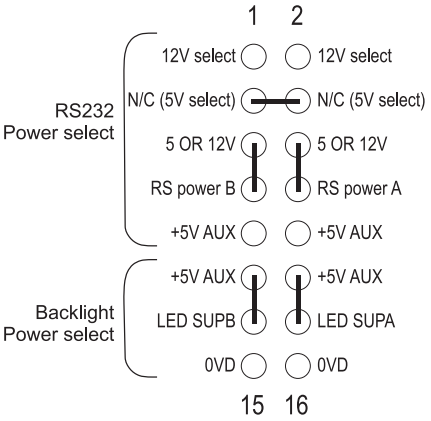
Used to set:

- RS232 supplies (12 V or 5 V).
- LCD backlights (on or off).



Default links:
Fit 3-4, 5-7, 6-8, 11-13, 12-14
(= 5V RS232, Backlights ON)

RS232 Power
Link pins 1 & 2 for +12 V on pins 5 & 6
Link pins 3 & 4 for +5 V on pins 5 & 6



Pin	Function
1 & 2 12V select	RS232 +12V select. Link together for 12 V RS232
3 & 4 N/C (5V select)	RS232 +5V select Link together for 5 V RS232
5 & 6 5 or 12 V	RS232 power supplies. Link to pins 7 and 8 as required
7 RS power A	RS232 (channel B = COM 2) power in. (Link to either Pin 5 or 9 as required)
8 RS power A	RS232 (channel A = COM 1) power in. (Link to either Pin 6 or 10 as required)
9 & 10 + 5 V AUX	+5V power supply. Can be used for RS232 supply (Link to pins 7 or 8 if required)
11 & 12 + 5 V AUX	Backlight enable Link to pins 13 & 14 as required, to enable display backlights.
13 LED SUP B	Mono Displays backlight power Enabled - Link to Pin11 Disabled - Link to Pin 15
14 LED SUP A	Column mounted Display backlight power Enabled - Link to Pin12 Disabled - Link to Pin 16

Pin	Function
15 & 16 0VD	Backlight disable Link to pins 13 & 14 as required, to disable display backlight.

9.1.5 Hardware compatibility

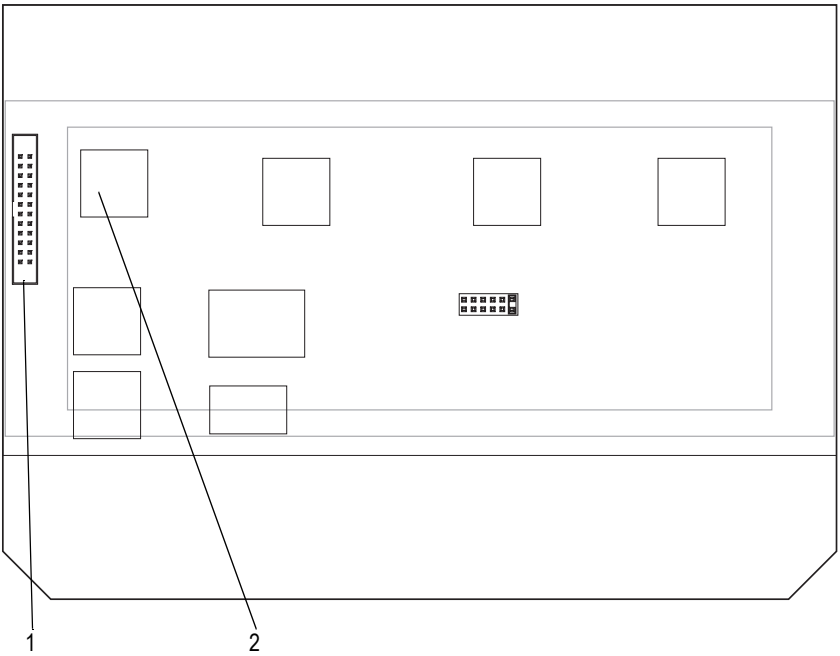
Compatible with all software and hardware.

9.1.6 Special precautions

- *Failure to set the correct printer type will result in damage to the printhead.*

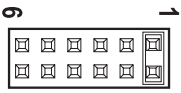
9.2 Display PCB

This PCB is used for both customer and vendor displays



1. Connector - Display data, loom to main board
2. Links - Display type select

Link settings



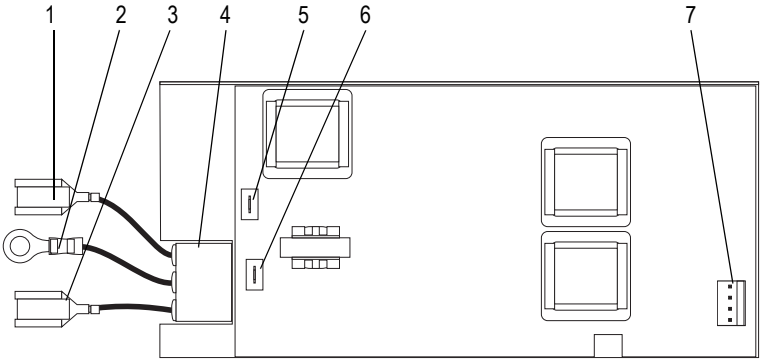
Link position	Function
1	Vendor
2	Customer
3	Not applicable
4	Not applicable
5	Not applicable
6	Not applicable

Backlight

The backlight can be enabled / disabled using links on the main board. See page 125.

9.3 Power supply

Sits on the underside of the scale, in a compartment within the scale base.



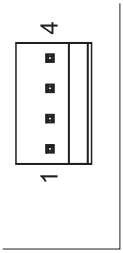
1. Mains (Live) to switch
2. Primary earth
3. Mains (Neutral) to switch
4. Mains in (IEC socket)
5. Switched mains in (Live)
6. Switched mains in (Neutral)
7. Power out - Loom to main board

Specification

Mains input:
110 - 230 VAC

Primary Fuse (on board):
3.15 A trip

Power output:

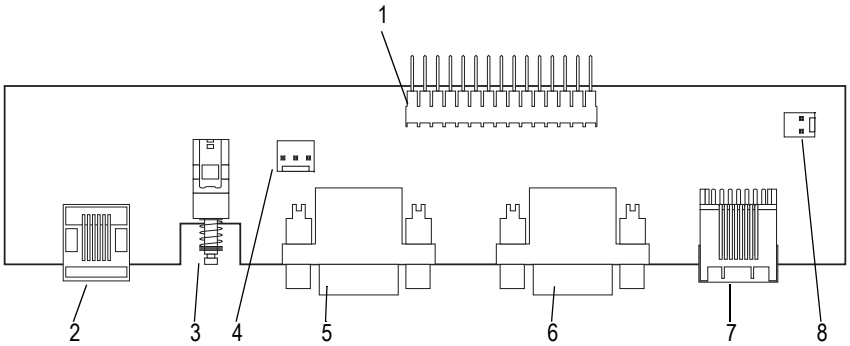


Pin	Function
1	0 V
2	0 V
3	+24 V dc
4	+24 V dc

9.4 I/O board

This PCB provides external connectivity. The main board plugs directly onto this module.

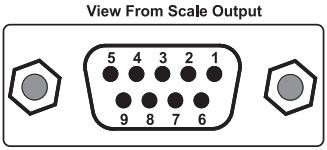
9.4.1 Module layout



1. Connect to main board
2. RJ12 - Cash draw connection
3. Service switch
4. Remote service switch input
5. Serial port - COM 1
6. Serial port - COM 2
7. RJ45 - Ethernet port
8. Relay output (for wrapper connection)

9.4.2 Pinouts

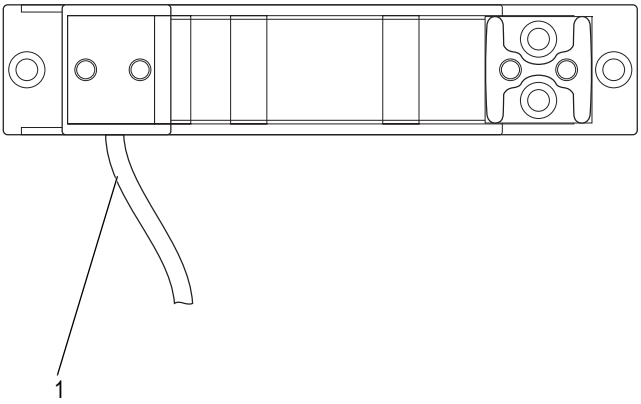
Serial ports



Pin	Function
1	N/C
2	RX
3	TX
4	N/C
5	0V
6	N/C
7	RTS (COM 1 ONLY)
8	CTS (COM 1 ONLY)
9	Power (+5 V or +12 V see page 125)
Shell	GND

9.5 T103 Loadcell

The standard loadcell fits inside the base unit.



1. Loom to main PCB

10 Networks

10.1 Introduction

10.2 Typical network

10.3 Network protocol

10.4 Wiring / terminations

10.5 Network setup

10.6 Using the network map

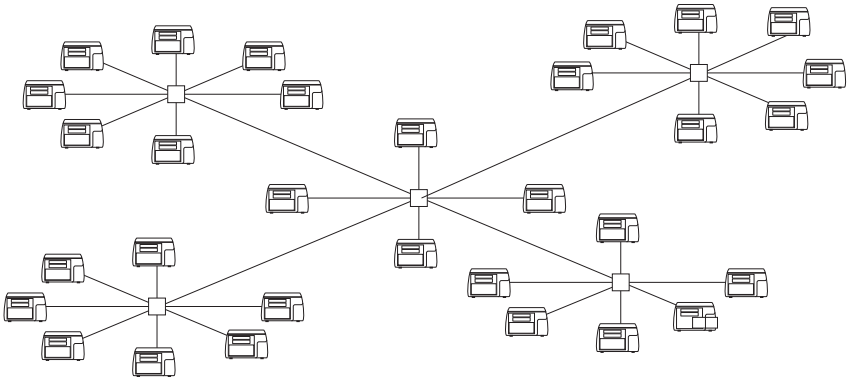
10.7 Backup server operation

10.8 Local mode

10.9 Adding a machine to a CX/Advantage network

10 Networks

10.1 Introduction



A network allows a number of scales to be connected together. Scales on a network can share resources and information (operators, PLUs etc.).

Networked scales are assigned to groups. The network can contain up to 99 groups, each having up to 31 scales. See page 138.

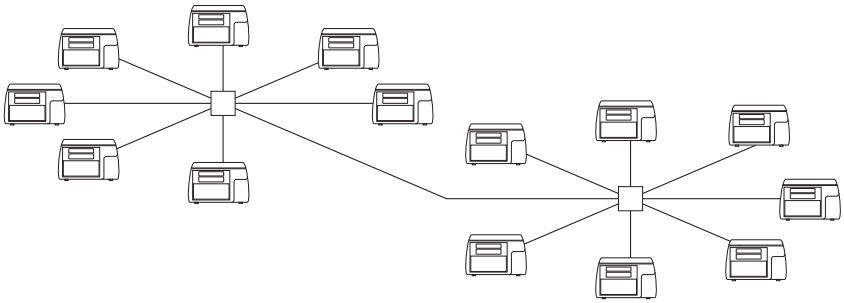
The machines can be connected to either one physical network hub or several.

10.2 Typical network

10.2.1 2 scale network

2 scales can be connected together without the use of a hub. A simple cross cable is used to link the machines together.

10.2.2 Multi-scale network



Scales are connected together using one or several hubs as required. The number and position of the hubs required is determined by the store layout and the type of hub used.

For example, hub arrangement could be affected by:

- Proximity of machines to each other.
- Number of network inputs available at each hub.

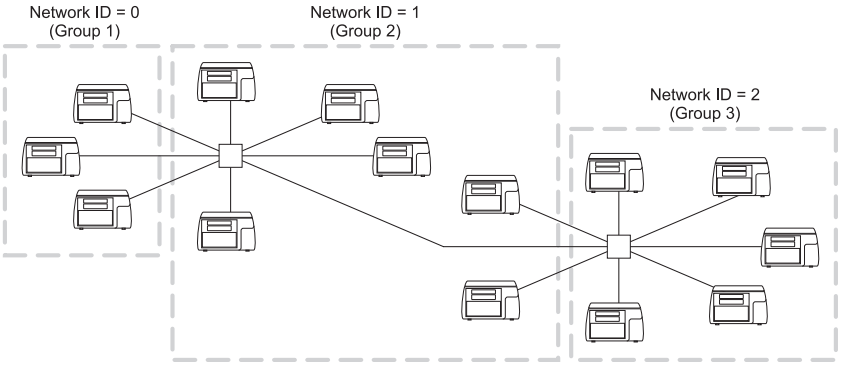
10.2.3 Groups of scales (network ID)

Machines can be put into groups of up to 31 scales.

The scale group is assigned by the **network ID** number. Up to 99 groups of scales can be connected to a network, giving a total of 3069 scales.

Each group of scales will have a server and a number of client scales.

Note: *For scales to share PLU information etc. with each other, they must be within the same group. (I.E. have the same network ID number)*



See *Manual network configuration* on page 142 for details of network ID and other settings.

10.3 Network protocol

M series scales' network protocol and speed are as follows:

- 10Mbs or 100 Mbs, 10 base T ethernet connection.
- TCP ICP protocol.

Network speed is selectable from within service setup mode. See *Network Setup* on page 72.

10.4 Wiring / terminations

Note: *Before setting up an in-store network, obtain the appropriate IP addresses from the store IT administrator. Enter the addresses at the machines before connecting the network. See section 10.5, Network setup for more information.*

For wiring and termination details refer to the 'Connecting PC networks' book. Brisch number 76102-559.

Cable lengths

The maximum cable length between each machine and the hub is one hundred metres.

Note: *It is usual to allow 5m at either end for the patch cable from the scale to the wall socket. This allows 90m for the cable run between network wall socket and patch panel.*

If the connections between hubs use 10 base T connections, then there should be no more than four hubs in series.

10.5 Network setup

The network settings are configured from within manager mode.

To enter manager mode:

1. Enter service mode (see page 38).
2. Press the ‘home’ key on the programming overlay.

For more detailed information on the manager menu operation see the separate user instructions (part 2).

Set up notes:

- For DHCP networks, set the IP address at each scale to 0.0.0.0.
  IP addresses will then be allocated by the DHCP server for the network.
- For new installations, using Auto configure to install machines to a network is a very quick way of getting all the machines working.
- Where auto configure is not suitable you can also manually alter each machine’s network settings.

10.5.1 Auto configure

Can be used to set up a stand-alone network of scales ‘straight out of the box’

Auto configure will:

- Detect all the machines that are connected to the network and have the same network ID.
- If there are no servers, it will make the machine that you are using into the server. The machine ID will be made into ID1 or the next available ID number. The server will then find each client machine in turn and give it a machine ID.
- If a server already exists, then the machine you are using will become a client machine and be given the next available machine ID.

Notes:

- This option will only assign scales within a single group. (i.e up to 31 scales, having the same network ID.) For greater than 31 scales, only 31 will be auto-configured. The remainder must be manually configured to be in a different group (with a different network ID).
- Machine IDs will be allocated in no particular order, so may not follow any logical pattern.

Auto configuration procedure:

1. Connect all the machines to the network hub and switch on.
2. Ensure that the network ID at each machine is set.
3. At the **server** scale, go to 'Auto configure' and press Enter. The scale that you are using will automatically detect the other scales within the group. This machine will become the server and the rest of the machines will be client machines.

Auto configure can also be used to add a new scale into an existing group. When doing this you may need to update the machine's PLU file by performing a network dump.

10.5.2 Manual network configuration

For each machine you may manually configure the settings described in this section.

Machine ID

Used to set the machine's ID within its group.

Setting	Description
Machine ID	0 = stand alone scale (not networked). 1 - 31 = The machine ID within its group of scales.
Server / Client	Set the scale to be either a server or a client scale.

Before setting a client machine to be a server you should:

- clear all transactions.
- clear all totals.

If a server already exists on the network then

- The new server becomes the back up server.
- An existing back up server will revert to client status.
- If you change a back up server to be a server, the old server becomes the back up.

Note: *See section section 10.7, Backup server operation, for more information.*

Network dump

For a group of scales (all sharing the same network ID); this option synchronises all data held at the client machines with that of the server.

M/c Setup dump

This option transfers all machine information (not system data) to the specified scale.

Advance settings

If you are installing a scale to an established network, then you must gather information about the network. The easiest way to do this is to use an existing machine to print a test report (press the test key twice). The settings of the new machine must be set so it will communicate with the existing machines on the network.

IP Address / Sub net mask

The IP address of the machine consists of two parts, the network address and the machine address. The network address must be the same as all the other machines on the same network, and the machine address must be different from the other machines on the same network.

The network address depends on which sub-net mask is used, for example for an IP address of 88.1.1.7:

Sub-net mask	255.0.0.0	255.255.0.0	255.255.255.0
Network address	**88**.1.1.7	**88.1**.1.7	**88.1.1**.7
Machine address	88.**1.1.7**	88.1.**1.7**	88.1.1.**7**

For DHCP networks, set the IP address at each scale to 0.0.0.0. IP addresses will then be allocated by the DHCP server for the network.

Note: *When manually setting up a network (i.e. DHCP is not applicable), obtain the IP addresses from the store IT administrator. Enter the addresses at the machines before connecting the network.*

Host name

For networks using DHCP, a unique text identifier may be programmed for each scale on the network.

Gateway IP address

A gateway can be used to bridge between 2 devices with different network addresses. The gateway will have a network address the same as the scale's and will re-route communications as required.

Network ID

A number 0-99 which is used to assign a scale to a particular group. See *Groups of scales (network ID)* on page 138.

Host port number

The host port number should only be changed if there is a conflict between the scale and some other piece of equipment. All machines in the same network must have the same base port number.

Ping IP Address

Used to test communications between the scale and another known IP address.

Data clone

Clones data from this scale to another within the same group. See *Data clone* on page 61.

10.5.3 Removing a scale

A scale can be removed from the network using the following option:

Manager mode >> Communication >> Machine ID

In brief

To remove a client scale from the network:

- Go to the client to be removed and set the **machine ID** to **0**.

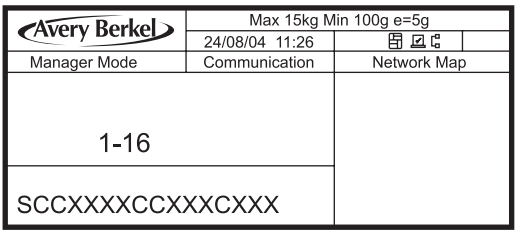
This will remove the client from the network and also inform the server of the change.

To remove a scale that is already off-line (fault reported at the server):

1. Go to the server and view the network map.
2. Press **Enter** to accept the map.
3. Press **Yes** to save the change (and clear the fault)

10.6 Using the network map

The network map shows the status of all the machines in the network group.



S = Server
B = Back up server
C = Client
O = Off-line
E = PLU file error
X = No machine present
L = Local mode
G = Link to CX Master

- Press **Enter** to display the second series of machines (17 - 31)
- Press **Enter** again to accept the map

Note: *If a machine has been removed from the network (pressing 'Yes' to save will remove it from the network map.*

10.7 Backup server operation

The backup server is a backup of the primary server. It is synchronised with the primary and hence contains identical information. It is used as a fail-safe for when the primary server is off line.

- If the primary server goes down, the backup server will become the primary server. When restored, the previous primary server will become the backup server.
- The receipt and transaction memory settings on the backup server must be identical to the main server.
- Although the backup and server continuously synchronise, the system should not be operated for extended periods with one server switched off. If this is the case (e.g. repair) the totals, transactions and the audit list should be cleared before reinstating a second server to ensure that they are synchronised.
- The date and time of synchronisation start and finish is stored in the system log.
- If you attempt to clear totals or transactions with backup off-line, a warning message is given.
- If more than one server is set the server that powers up first will be the primary server with the second set to the backup server.
- In the instance of a communications failure between backup and primary servers, the backup server will become primary, when the cable is reconnected there will be two servers. In this instance the first server to detect this will demote the other to backup server.
- The backup server acts as client in terms of clearing totals etc. i.e. the request is sent to the primary server, the backup server will also perform the request locally.

- If both servers have failed the client will ask if the user wishes to enter local mode, on confirmation all totals and transactions will be cleared from the client local memory. The first transaction or total request, for each operator on the local machine will display a warning to re-enter transactions.

10.8 Local mode

Local mode operation

If a client scale becomes disconnected from the server (e.g. because of a network fault). It will operate in local mode.

A machine operating in local mode will generate and store, totals, receipts and transactions locally.

Local mode recovery

When the network is restored, the server will recover transaction data from all machines in local mode, and restore all local machines as clients.

The server will then re-generate the local machine totals using the transaction data collected.

Note: *If the local mode machine fails to store all transactions (e.g. because of insufficient memory) then the totals generated by the server will be incorrect.*

Transaction memory in local mode

For a scale operating in local mode, the transaction memory stores both live and cleared transactions until the server is back on line and able to synchronise the data. It is therefore important that sufficient transaction memory is allocated. See *Memory setting guidelines* on page 73.

10.9 Adding a machine to a CX/Advantage network

M series machines may be integrated into an existing CX/ Advantage machine network.

Only M series machines set to server status will communicate with CX Advantage machines so you must set the Advantage IP address at a server machine.

M series machines can only communicate with CX/Advantage machines fitted with an ethernet comms controller.

When performing a scale dump from a M series machine to a CX/Advantage machine, only the PLU file will be copied.

10 Modem operation

10.1 Modem setup

10.2 Setting up a dial up account on the PC

10.3 Modem connection

11 Modem operation

The scale can be connected to a modem via serial port 1.

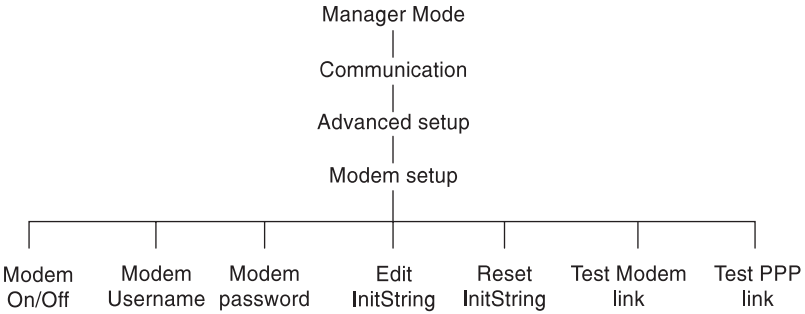
Note: *The modem and the MX050 both share Serial port 1, consequently the machine has to be set to use one or the other. It is not possible to use both together.*

Modem protocol

When enabled the scale can use the modem to talk to any remote PC using the industry standard PPP protocol.

Note: *The machine cannot dial out to a remote PC; it waits for an incoming call from a remote PC.*

11.1 Modem setup



The modem settings are configured from within manager mode.

To enter manager mode:

1. Enter service mode (see page 38).
2. Press the ‘home’ key on the programming overlay.

For more detailed information on the manager menu operation see the separate user instructions (part 2).

Modem username and password

To establish a link between the remote computer and the scale, the username and password at the scale must match exactly those used to set up the ‘dial up account' on the PC.

There are 2 new menus in the machine to allow Username and Password to be entered. Note: They are stored in battery backed memory in the machine, and are case sensitive

Default username = **manager**

Default password = **password**

Initstring

When the machine is switched on, providing the modem is enabled, it will send its default Initstring to the modem. This configures how the modem will behave.

Default initstring is:
AT M0 S0=2 V1 X4 &K3 &D0

Code	Description
AT	All Initstrings must start with AT (it is short for `AT'tention)
MO	Mute the loudspeaker
SO=2	answer incoming calls after 2 rings
V1	respond with verbose replies
X4	advanced result codes
&K3	enable hardware handshaking with CTS and RTS
&D0	ignore DTR, therefore always answer incoming call
Note: Some modems may use a command other than &K3 to enable CTS/ RTS handshaking. Check the modem manufacturer's documentation and, if necessary, use the 'Edit Initstring' function to modify the initstring.	

Note: *When using the Edit InitString Menu the last character in the initstring must be a linefeed*

Edit initstring

Allows you to edit the initstring to suit a particular modem

The edited initstring is sent to the modem and the modem will then either respond with `OK' or `ERROR' to this new string. If the modem responds with OK, then the machine will tell the modem to store away this setting in the modems user profile 0. This profile 0 is non-volatile memory, therefore the

modem can now be switched off and on and it will retain the new initstring.

The initstring and the modem response will be logged in the System log. It is recommended that this is checked to ensure the modem accepted the string as `OK'.

Reset InitString

This will reset the Initstring to the factory default string.

Test modem link

This checks that the modem and the link to it are working.

Test PPP link

This checks whether the machine is linked to a remote PC via the modem.

If the machine displays `PPP link up' the modem is working and someone has dialled up this machine from a remote PC, and the password/Username has been accepted and the PPP link is authenticated and established.

11.2 Setting up a dial up account on the PC

In order to communicate with the Mosaic machine via a modem, a `dial up account' must be set up on the PC with the correct parameters. The procedure for doing this differs between the various versions of Windows.

Before setting up the account you must:

1. Check that the PC has a correctly installed modem.
2. Ensure that Windows Dial Up Networking is installed on the PC. Check the Windows documentation for how to do this.
3. Ensure TCP/IP protocol is enabled. Check the Windows documentation for how to do this.
4. Create a dial up networking account on the PC.

Setup using MX050 (Recommended)

MX050 can be used to setup the PC. The MX050 software will prompt the user for the following items:

- Phone book name
- Scale username
  must match username defined on the machine
- Scale password
  must match password defined on the machine
- Phone number

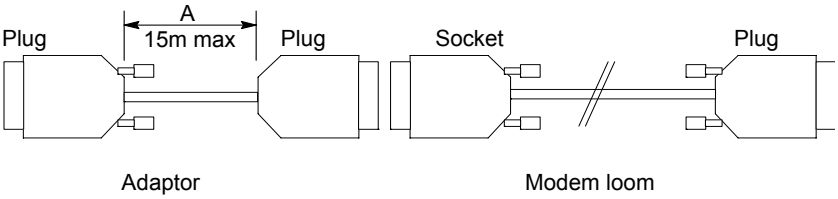
The remaining items are set up automatically.

Manual setup

When creating the dial up account manually, you must also set up these items:

Item	Setting
Baud rate	38400
Data bits	8
Parity	None
Stop Bits	1
Hardware flow control	Enable
Modem error control	Enable
Modem compression	Enable
Server type	PPP: Windows NT, Windows 95 Plus, Internet
Protocol	TCP/IP Network protocol
TCP/IP Settings	Server assigned IP address Server assigned name & server address
Server settings	Disable modem compression Disable PPP LCP extensions DIsable IP header compression Disable user default gateway.

11.3 Modem connection



Modem adaptor cable

A short adaptor loom is required together with the standard modem loom (i.e. DTE to DCE loom) to connect a modem to serial port 1.

- 9 way ‘D’ type plug at either end

Length `A' should be as required for the particular situation.

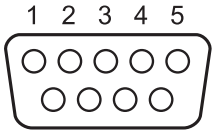
Standard modem loom

5 cores are required to connect the scale and modem.

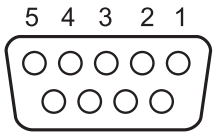
The standard modem loom has a 9 way D' type plug at the Modem end and a 9 way D' type socket at the end that normally connects to a computer.

- All connections are ‘straight through’ i.e. Pin2 - Pin2 etc.
- 9 way ‘D’ type Plug at one end, socket at the other.

9 way D plug (front view)



9 way D socket (front view)



Pin	Function
2	RX to scale (scale input).
3	TX from scale (scale output).
5	0V
7	RTS from scale (scale output)
8	CTS to scale (scale input)
Note: All connections are ‘straight through’ i.e. Pin2 - Pin2 etc.	

Note: *All other pins are not connected.*

Index

Numerics

10 BaseT 72
10/100 BaseT 72
110V 11
2 scale network 138
230V 11

A

Accounts memory 72
Add function 46
Auto configure 141

B

Backup server 147
Batteries
    replacing 12

C

Cable clamp 26
Cable lengths 140
Cable management 26
Calibration menu 54
Capacity 45
Cleaning the print head 97
Client 138
Clone
    data 61
    machine 60
Cold Start 70
Column mounting 88
Comms log 43
Comms. log 42
Configuration 45
Configuration menu 45
Configuration menus 38
Configuration tables
    sw version 5.0 45
Configure
    networks 141
Connection
    modem 158
Connections
    external 115
    internal 117
Country configuration 50
Cover 81
Cross 81
Currency symbol 47, 50
Currency text 72
Customer display
    chassis 84
    exploded view 108
CX/Advantage network 150

D

Data clone 61, 145
DCU converter 27
Decimal places 47
DHCP 141, 144
Diagnostic logs 42
Diagnostics 41
    factory reset 70
    initialise machine 70
    keyboard test 41
    printer setup 69
    weighing test 41
Dial up account 156
Dip switch 125
Display 31
    column mounting 88
    PCB 128
Displays 31

schematic 118
Documentation CD 23
Dual server 75

E

Edit Format 62
Electric shock 11
ESD
handling precautions 12
Euro setup 57
Euro wizard 58
Exit service mode 39
Expansion boards
installation 90
Exploded views 103

F

Factory reset 70
Factory reset values 71
Feet 25
Field position 67
Format 62
Formats
receipt 52
Front cover 85
Full service access 38

G

Gateway 144
Gravity 55
Groups of scales 138

H

Handling
ESD 12
precautions 24
safe 12
Host name 144
Host port number 144
Hub 138

I

I/O board 94, 132
Initialise 70
Initstring 154
Installation 23
location 24
precautions 24
self service keyboard 28
Internal
connections 117
IP Address 143, 144
IP addresses 141

K

Key layout 51
Key log 42, 43
Keyboard 86
installation 28
test 41
Keys 31, 32
Kit list 23

L

Label editor 62, 63
Language 51
Left cover 82
Levelling 25
Loadcell 92, 134
terminations 119
Local mode 149
Location 24
Log size 44
Logs 42

M

M/c Setup dump 143
M100
exploded view 103, 106, 108, 110
overview 15
M200
overview 16
M202
overview 17
M300
overview 18
M300 TK keyboard 28
M400
overview 19
M651
overview 20
Machine address 144
Machine ID 142
Main board 89, 123
Mains 11
Mains lead 11
Manager mode 141
enter 39
Memory 72
setting guidelines 73
Memory expansion
installation 90
Modem 153
adaptor 158
dial up account 156
reset initstring 155
setup 153
username and password 153
Modem connection 158
Module information 123
Multi-scale network 138

N

Navigating 40
Network
Advance settings 143
auto configure 141
CX/Advantage 150
groups 138
introduction 137
map 146
protocol 140
setup 72, 141
typical 138
wiring 140
Network address 144
Network dump 143
Network ID 138, 144
restrictions 60, 61
Network test 41
Networking
CX/Advantage machines 150
local mode recovery 149
Networks 137
Nose cone 85

O

Overview
external connections 115
service mode 37
Overviews 15

P

Paper routes 99
Password
modem 153
PIN 56
Ping IP Address 144
Power down 79
Power supply 93

PCB 130
Power up 79
PPP link
test 155
Precautions 12
Primary currency 58
primary server 147
Print head 96
cleaning 97
Print Logs 42
Printer
exploded view 110
select 125
servicing 95
Printer setup 69
Printhead life 69
Programming 37
Protocol
modem 153
Punctuation 47

R

RAM expansion board 90
Rear cover 83
Removing a scale 145
Repetitive Strain Injury 24
Replacing batteries 12
Restart 70
Restricted service access 38
RF 91
Rounding 47, 48
RSI 24

S

Safety 11
Sales key 51
Sales mode 46
Scanner connection 116
Schematic 115
Secondary currency 57
Sensor
print 69
Serial
scanner connection 116
Serial test 42
Server 138
backup 147
server 147
Service menus 40
Service mode 37
entering 38
exit 38
overview 37
Service PIN 39, 56
Service precautions 12
Service procedures 79
Service setup 69
Single server 74
Spirit level 25
Sub net mask 143
Synchronise 147
System log 42, 43

T

T103 Loadcell 134
Tare display 46
Top cover 81
Traceablity memory 72
Trans memory
client 73
server 74
Transaction memory 72, 149
Typical network 138

U

Username
modem 153

V

Vendor display 85
    assembly 86
    exploded view 106

W

Warm restart 70
Weighing test 41
Wiring
    networks 140
Wiring diagrams 115
Wizard
    euro 58
WLAN 91

Z

Zero 50

The address of your Avery Weigh-Tronix centre is:

This document contains a general guide only of the product and shall not form part of any contract unless specifically agreed by Avery Berkel Limited in writing in each case on the Order Acknowledgement. The specification of the products described herein may vary from time to time and may be altered without notice. Avery Weigh-Tronix is a trading name of Avery Berkel Limited.

Avery Weigh-Tronix

UK
Avery Weigh-Tronix
Foundry Lane, Smethwick
West Midlands, England B66 2LP

Tel : +44 (0) 870 903 4343
Fax : +44 (0) 121 224 8183

Email: info@awtxglobal.com
Website: www.averyweigh-tronix.com

USA
Avery Weigh-Tronix
1000 Armstrong Dr.
Fairmont MN 56031 USA

Tel : +1 507-238-4461
Fax : +1 507-238-4195

Email: industrial@weigh-tronix.com
Website: www.averyweigh-tronix.com